SHARP SERVICE MANUAL

S7717R340APHR

MICROWAVE OVEN

MODEL R-340A

In interests of user-safety the oven should be restored to its original condition and only parts identical to those specified should be used.

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SHARP CORPORATION

SERVICE MANUAL

SHARP

MICROWAVE OVEN

R-340A

GENERAL IMPORTANT INFORMATION

This Manual has been prepared to provide Sharp Corp. Service engineers with Operation and Service Information.

It is recommended that service engineers carefully study the entire text of this manual, so they will be qualified to render satisfactory customer service.

CAUTION
MICROWAVE RADIATION

DO NOT BECOME EXPOSED TO RADIATION FROM THE MICROWAVE GENERATOR OR OTHER PARTS CONDUCTING MICROWAVE ENERGY.

Service engineers should not be exposed to the microwave energy which may radiate from the magnetron or other microwave generating devices if it is improperly used or connected. All input and output microwave connections, waveguides, flanges and gaskets must be secured. Never operate the device without a microwave energy absorbing load attached. Never look into an open waveguide or antenna while the device is energized.

WARNING

Never operate the oven until the following points are ensured.
(A) The door is tightly closed.
(B) The door brackets and hinges are not defective.
(C) The door packing is not damaged.
(D) The door is not deformed or warped.
(E) There is not any other visible damage with the oven.

Servicing and repair work must be carried out only by trained service engineers.

All the parts marked "*" on parts list are used at voltages more than 250V.

Removal of the outer wrap gives access to potentials above 250V.

All the parts marked "Δ" on parts list may cause undue microwave exposure, by themselves, or when they are damaged, loosened or removed.

SHARP CORPORATION

OSAKA, JAPAN

PRODUCT SPECIFICATIONS
APPEARANCE VIEW
OPERATING SEQUENCE
FUNCTION OF IMPORTANT COMPONENTS
SERVICING AND TROUBLESHOOTING CHART
TEST PROCEDURE
TOUCH CONTROL PANEL ASSEMBLY
COMPONENT REPLACEMENT AND ADJUSTMENT PROCEDURE
MICROWAVE MEASUREMENT
WIRING DIAGRAM
PARTS LIST

PRODUCT SPECIFICATIONS

ITEM	DESCRIPTION
Power Requirements	220 Volts 50 Hertz Single phase, 3 wire earthed
Power Consumption	1.5kW
Power Output	1000 watts nominal of RF microwave energy (IEC 705) Operating fequency 2450 MHz
Case Dimensions	Width 520 mm Height 302 mm including foot Depth 403 mm
Cooking Cavity Dimensions	Width 348 mm Height 212 mm Depth 379 mm
Turntable diameter	335mm
Control Complement	Touch Control System Clock (1:00 - 12:59) Timer (0 - 99 minutes 99 seconds) Microwave Power for Variable Cooking Repetition Rate; HIGH ..... Full power throughout the cooking time MEDIUM HIGH ..... approx. 70% of Full Power MEDIUM ..... approx. 50% of Full Power MEDIUM LOW ..... approx. 30% of Full Power LOW ..... approx. 10% of Full Power INSTANT ACTION pads DEFROST pad NUMBER pads POWER LEVEL pad TIMER / CLOCK pad STOP/CLEAR pad INSTANT COOK/START pad
Set Weight	Approx. 17 kg

GENERAL INFORMATION

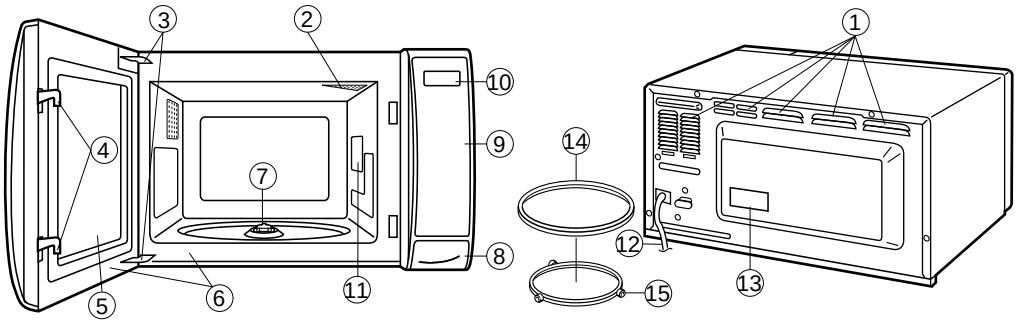
WARNING
THIS APPLIANCE MUST BE EARTHED

IMPOTANT
THE WIRES IN THIS MAINS LEAD ARE COLOURED IN ACCORDANCE WITH THE FOLLOWING CODE:

GREEN-AND-YELLOW	: EARTH
BLUE	: NEUTRAL
BROWN	: LIVE

APPEARANCE VIEW

1. Ventilation openings
2. Oven lamp
3. Door hinges
4. Door safety latches
5. See through door
6. Door seals and sealing surfaces
7. Coupling
8. Door open button
9. Touch control panel
10. Digital readout
11. Wave guide cover
12. Power supply cord
13. Rating label
14. Turntable tray
15. Turntable support



TOUCH CONTROL PANEL

Indicator

INSTANT ACTION PADS
Press to cook or reheat 8 popular manus.

NUMBER PADS
Press to enter cooking times, clock time or weight of food.

DEFROST PAD
Press to select the Defrost menu.

POWER LEVEL PAD
Press to select microwave power setting. If not pressed, 100% is automatically selected.
Press to alter the cooking result for automatic operations.

TIMER / CLOCK PAD
Press to set Clock, timer, child lock or demonstration mode.

INSTANT COOK/START PAD
Press to start oven after setting programmes. Press once to cook for 1 minute on HIGH or increase in 1 minute increments each time this pad is pressed during cooking.

STOP/CLEAR PAD
Press to clear during programming.
Press once to stop operation of oven during cooking; press twice to cancel cooking programme.

OPERATION SEQUENCE

OFF CONDITION

Closing the door activates all door interlock switches (1st. latch switch and 2nd. interlock relay control switch).

IMPORTANT
When the oven door is closed, the monitor switch contacts (COM-NC) must be open.
When the microwave oven is plugged in a wall outlet, rated voltage is supplied to the control unit.

Figure O-1 on page 25

1. The display will show flashing "88:88".
2. To set any programmes or set the clock, you must first touch the STOP/CLEAR pad.
3. " : " appears in the display.

NOTE: When the oven door is opened, the oven lamp comes on at this time.

MICROWAVE COOKING CONDITION

HIGH COOKING

Enter a desired cooking time with the touching NUMBER pad and start the oven with touching START pad.

Function sequence

Figure O-2 on page 25

CONNECTED COMPONENTS	RELAY
Oven lamp, Fan motor, Turntable motor	RY1
Power transformer	RY2

1. Rated voltage. is supplied to the primary winding of the power transformer. The voltage is converted to about 3.3 volts A.C. output on the filament winding and high voltage of approximately 2000 volts A.C. on the secondary winding.
2. The filament winding voltage (3.3 volts) heats the magnetron filament and the high voltage (2000 volts) is sent to the voltage doubling circuit, where it is doubled to negative voltage of approximately 4000 volts D.C..
3. The 2450 MHz microwave energy produced in the magnetron generates a wave length of 12.24 cm. This energy is channelled through the waveguide (transport channel) into the oven cavity, where the food is placed to be cooked.
4. When the cooking time is up, a signal tone is heard and the relays RY1+RY2 go back to their home position. The circuits to the oven lamp, power transformer, fan motor and turntable motor are cut off.
5. When the door is opened during a cook cycle, the switches come to the following condition

SWITCH	CONTACT	CONDITION DURING COOKING	DOOR OPEN (NO COOKING)
1st. latch switch	COM-NO	Closed	Open
2nd. interlock relay control switch	COM-NO	Closed	Open
Monitor switch	COM-NC	Open	Closed

The circuits to the power transformer, fan motor and turntable motor are cut off when the 1st. latch switch and 2nd. interlock relay control switch are made open. The oven lamp remains on even if the oven door is opened after the cooking cycle has been interrupted, because the relay RY1 stays closed. Shown in the display is the remaining time.

6. MONITOR SWITCH CIRCUIT
The monitor switch is mechanically controlled by oven door, and monitors the operation of the 1st latch switch and 2nd. interlock relay.

6-1 When the oven door is opened during or after the cycle of a cooking program, the 1st. latch switch and 2nd. interlock relay control switch must open their contacts first.
After that the contacts (COM-NC) of the monitor switch can be closed.

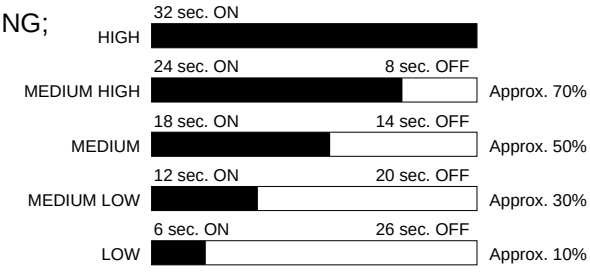
6-2. When the oven door is closed, the contacts (COM-NC) of the monitor switch must be opened. After that the contacts of the 1st. latch switch and 2nd. interlock relay control switch are closed.

6-3. When the oven door is opened and the contacts of the 1st. latch switch and 2nd. interlock relay remain closed. The fuse M10A will blow, because the monitor switch is closed and a short circuit is caused.

MEDIUM HIGH, MEDIUM, MEDIUM LOW, LOW COOKING

When the microwave oven is preset for variable cooking power, rated voltage is supplied to the power transformer intermittently within a 32-second time base through the relay contact which is coupled with the current-limiting relay. The following levels of microwave power are given.

SETTING;



NOTE: TheON/OFF time ratio does not exactly correspond to the percentage of microwave power, because approx. 2 seconds are needed for heating up the magnetron filament.

FUNCTION OF IMPORTANT COMPONENTS

DOOR OPEN MECHANISM

The door is opened by pushing the open button on the control panel, refer to the Figure D-1.
When the open button is pushed, the open button pushes up the switch lever, and then the switch lever pushes up the the latch head. The latch heads are moved upward and released from latch hook. Now the door will open.

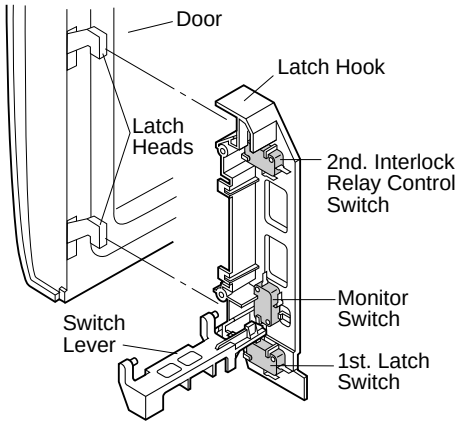


Figure D-1. Door Open Mechanism

1ST. LATCH SWITCH AND 2ND. INTERLOCK RELAY CONTROL SWITCH

1. When the oven door is closed, the contacts COM-NO) must be closed.
2. When the oven door is opened, the contacts .(COM-NO) must be opened.

MONITOR SWITCH

1. When the oven door is closed, the contacts (COM-NC) must be opened.
2. When the oven door is opened, the contacts (COM-NC) must be closed.
3. If the oven door is opened and the contacts (COM-NO) of the 1st. latch switch and 2nd. interlock relay fail to open, the fuse M10A blows simultaneously with closing the contacts (COM-NC) of the monitor switch.

CAUTION: BEFORE REPLACING A BLOWN FUSE M10A TEST THE 1ST. LATCH SWITCH, 2ND. INTERLOCK RELAY, 2ND. INTERLOCK RELAY CONTROL SWITCH, MONITOR SWITCH AND MONITOR RESISTOR FOR PROPER OPERATION.

MONITOR RESISTOR R 0.8Ω 20W

The monitor resistor prevents the fuse M10A bursting when the fuse M10A blows due to the operation of the monitor switch.

FUSE M10A

1. The fuse M10A blows when the contacts (COM-NO) of the 1st. latch switch and 2nd. interlock relay remain closed with the oven door open and when the monitor switch closes.
2. If the wire harness or electrical components are short-circuited, this fuse M10A blows to prevent an electric shock or fire hazard.

HIGH VOLTAGE FUSE 0.75A

The high voltage fuse blows when the high voltage rectifier or the magnetron is shorted.

OVEN THERMAL CUT-OUT

The thermal cut-out, located on the top of the oven cavity, is designed to prevent damage to the oven by fire. If the foods load is overcooked, by either error in cook time or defect in the control unit, the thermal cut-out will open.
Under normal operation, the oven thermal cut-out remains closed. However, when abnormally high temperatures are reached within the oven cavity, the oven thermal cut-out will open at 125˚C, causing the oven to shut down. The defective thermal cut-out must be replaced with new one.

MAGNETRON THERMAL CUT-OUT

The thermal cut-out located near the magnetron is designed to prevent damage to the magnetron if an over heated condition develops in the tube due to cooling fan failure, obstructed air guide, dirty or blocked air intake, etc. Under normal operation, the thermal cut-out remains closed. However, when abnormally high temperatures are reached within the magnetron, the thermal cut-out will open at 95˚C causing the oven to shut down, when the magnetron has cooled to 75˚C, the thermal cut-out closes and cook cycle will resume.

TURNTABLE MOTOR

The turntable motor drives the turntable roller assembly to rotate the turntable.

FAN MOTOR

The fan motor drives a blade which draws external cool air. This cool air is directed through the air vanes surrounding the magnetron and cools the magnetron. This air is channeled through the oven cavity to remove steam and vapors given off from the heating foods. It is then exhausted through the exhausting air vents at the oven cavity

NOISE FILTER

The noise filter prevents the radio frequency interference that might flow back in the power circuit.

SERVICING

WARNING TO SERVICE PERSONNEL

Microwave ovens contain circuitry capable of producing very high voltage and current, contact with following parts of the high voltage circuit will result in electrocution. High voltage capacitor, Power transformer, Magnetron, High voltage rectifier assembly, High voltage harness.

REMEMBER TO CHECK 3D

1) Disconnect the supply.
2) Door opened, and wedged open.
3) Discharge high voltage capacitor.

WARNING: AGAINST THE CHARGE OF THE HIGH-VOLTAGE CAPACITOR

The high-voltage capacitor remains charged about 60 seconds after the oven has been switched off. Wait for 60 seconds and then short-circuit the connection of the high-voltage capacitor (that is, of the connecting lead of the high-voltage rectifier) against the chassis with the use of an insulated screwdriver.

Sharp recommend that wherever possible fault-finding is carried out with the supply disconnected. It may in, some cases, be necessary to connect the supply after the outer case has been removed, in this event carry out 3D checks and then disconnect the leads to the primary of the power transformer. Ensure that these leads remain isolated from other components and the oven chassis. (Use insulation tape if necessary.) When the testing is completed carry out 3D checks and reconnect the leads to the primary of the power transformer.

REMEMBER TO CHECK 4R

1) Reconnect all leads removed from components during testing.
2) Replace the outer case (cabinet).
3) Reconnect the supply.
4) Run the oven. Check all functions.

Microwave ovens should not be run empty. To test for the presence of microwave energy within a cavity, place a cup of cold water on the oven turntable, close the door and set the microwave timer for two (2) minutes. Set the power level to HIGH and push the START button. When the two minutes has elapsed (timer at zero) carefully check that the water is now hot. If the water remains cold carry out 3D checks and re-examine the connections to the component being tested.

When all service work is completed, and the oven is fully assembled, the microwave power output should be checked and microwave leakage test carried out

TROUBLESHOOTING GUIDE

When troubleshooting the microwave oven, it is helpful to follow the Sequence of Operation in performing the checks. Many of the possible causes of trouble will require that a specific test be performed. These tests are given a procedure letter which will be found in the "Test Procedure"section.

IMPORTANT: If the oven becomes inoperative because of a blown fuse M10A in the 1st. latch switch - 2nd. interlock relay - monitor switch - monitor resistor circuit, check the 1st. latch switch, 2nd. interlock relay control switch, 2nd. interlock relay, monitor switch and monitor resistor before replacing the fuse M10A.

CK = Check / RE = Replace

CONDITION	PROBLEM / POSSIBLE CAUSE AND DEFECTIVE PARTS	A MAGNETRON	B POWER TRANSFORMER	C H.V. RECTIFIER ASSEMBLY	D HIGH VOLTAGE CAPACITOR	E 1ST. LATCH SWITCH	E 2ND. INTERLOCK RELAY CONTROL SWITCH	E MONITOR SWITCH	G MONITOR RESISTOR	F THERMAL CUT-OUT 95°C	F THERMAL CUT-OUT 125°C	H FAN MOTOR	H TURNTABLE MOTOR	I FUSE M10A	L TOUCH CONTROL PANEL	M KEY UNIT	N RELAY (RY-1, RY-2)	O FOIL PATTERN ON P.W.B.	RE POWER SUPPLY CORD	CK SHORTED WIRE HARNESS	CK OPENED WIRE HARNESS	RE OVEN LAMP OR SOCKET	CK WALL OUTLET	CK MISADJUSTMENT SWITCH	CK HOME FUSE OR BREAKER	CK BLOCKED COOLING FAN	CK BLOCKED VENTILATION	J NOISE FILTER	K HIGH VOLTAGE FUSE
OFF CONDITION	Home fuse blows when power supply cord is plugged into wall outlet.																		○	○					○				
	FUSE M10A blows when power supply cord is plugged into wall outlet.							○						○						○				○				○	
	Display does not show anything when power supply cord is plugged into wall outlet.									○	○			○	○			○	○		○		○		○			○	
	Display does not operate properly when STOP/CLEAR pad is touched.						○								○	○					○			○					
	Oven lamp does not light at door opened. (Display appears.)						○								○		○			○	○	○							
ON CONDITION	Oven does not start when the START pad is touched. (Display appears)														○	○	○				○			○					
	Oven lamp does not light (Display appears.)														○		○				○	○							
	Fan motor does not operate. (Display appears.)					○						○					○				○			○		○			
	Turntable motor assembly does not operate. (Display appears.)					○							○				○				○			○					
	Oven or any electrical parts does not stop when cooking time is 0 or STOP/CLEAR pad is touched.														○		○												
	Oven seems to be operating but little or no heat is produced in oven load. (Microwave power level is set at HIGH)	○	○	○	○										○		○				○								○
	Oven does not seems to be operating properly when oven is set for variable cooking power. (Oven operates properly at HIGH and when the STOP/CLEAR pad is touched the oven stops.)														○		○												
	Oven goes into cook cycle but shuts down before end of cooking cycle.									○	○				○											○	○		

TEST PROCEDURES

PROCEDURE LETTER	COMPONENT TEST

A **MAGNETRON TEST**

NEVER TOUCH ANY PART IN THE CIRCUIT WITH YOUR HAND OR AN INSULATED TOOL WHILE THE OVEN IS IN OPERATION.

CARRY OUT 3D CHECK.

Isolate the magnetron from high voltage circuit by removing all leads connected to filament terminal.

To test for an open circuit filament use an ohmmeter to make a continuity test between the magnetron filament terminals, the meter should show a reading of less than 1 ohm.

To test for short filament to anode condition, connect ohmmeter between one of the filament terminals and the case of the magnetron (ground). This test should be indicated an infinite resistance. If a low or zero resistance reading is obtained then the magnetron should be replaced.

MICROWAVE OUTPUT POWER (1 Litre water load)

The following test procedure should be carried out with the microwave oven in a fully assembled condition (outer case fitted). Microwave output power from the magnetron can be measured by way of IEC 705, i.e. it can be measured by using water load how much it can be absorbed by the water load. To measure the microwave output power in the microwave oven, the relation of calorie and watt is used. When P(W) heating works for t(second), approximately P x t/4.187 calorie is generated. On the other hand, if the temperature of the water with V(ml) rises ΔT (°C) during this microwave heating period, the calorie of the water is V x ΔT.

The formula is as follows;

$P \times t / 4.187 = V \times \Delta T$ $P (W) = 4.187 \times V \times \Delta T / t$

Our condition for water load is as follows:

Room temperature ..... around 20°C Power supply Voltage ..... Rated voltage

Water load ..... 1000 g Initial temperature ..... 10±2°C Heating time ..... 42 sec.

$P = 100 \times \Delta T$

Measuring condition:

1. Container
   The water container must be a cylindrical borosilicate glass vessel having a maximum material thickness of 3 mm and an outside diameter of approximately 190 mm.
2. Temperature of the oven and vessel
   The oven and the empty vessel are at ambient temperature prior to the start the test.
3. Temperature of the water
   The initial temperature of the water is (10±2)°C.
4. Select the initial and final water temperature so that the maximum difference between the final water temperature and the ambient temperature is 5˚C.
5. Select stirring devices and measuring instruments in order to minimize addition or removal of heat.
6. The graduation of the thermometer must be scaled by 0.1°C at minimum and accurate thermometer.
7. The water load must be (1000±5) g.
8. "t" is measured while the microwave generator is operating at full power. Magnetron filament heat-up time is not included.

NOTE: The operation time of the microwave oven is "t + 2" sec. 2 sec. is magnetron filament heat-up time.

Measuring method:

1. Measure the initial temperature of the water before the water is added to the vessel.
   (Example: The initial temperature T1 = 11°C)
2. Add the 1 litre water to the vessel.
3. Place the load on the centre of the shelf.
4. Operate the microwave oven at HIGH for the temperature of the water rises by a value Δ T of (10 ± 2)˚C.
5. Stir the water to equalize temperature throughout the vessel.
6. Measure the final water temperature. (Example: The final temperature T2 = 21°C)
7. Calculate the microwave power output P in watts from above formula.

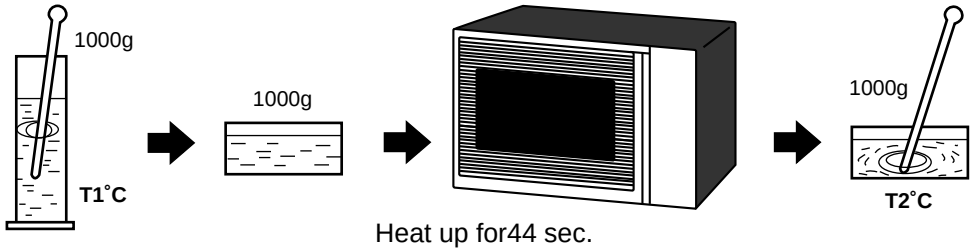
TEST PROCEDURES

PROCEDURE LETTER	COMPONENT TEST

Initial temperature ..... T1 = 11°C
Temperature after (42 + 2) = 44 sec. ..... T2 = 21°C
Temperature difference Cold-Warm ..... ΔT1 = 10°C
Measured output power
The equation is "P = 100 x ΔT" ..... P = 100 x 10°C = 1000 Watts

JUDGMENT: The measured output power should be at least ± 15 % of the rated output power.

CAUTION: 1°C CORRESPONDS TO 100 WATTS REPEAT MEASUREMENT IF THE POWER IS INSUFFICIENT.



B **POWER TRANSFORMER TEST**

WARNING: High voltages and large currents are present at the secondary winding and filament winding of the power transformer. It is very dangerous to work near this part when the oven is on. NEVER make any voltage measurements of the high-voltage circuits, including the magnetron filament.

CARRY OUT 3D CHECKS.

Disconnect the leads to the primary winding of the power transformer. Disconnect the filament and secondary winding connections from the rest of the HV circuitry. Using an ohmmeter, set on a low range, it is possible to check the continuity of all three windings. The following readings should be obtained:

a. Primary winding ..... approx. 1.2 Ω
b. Secondary winding ..... approx. 86 Ω
c. Filament winding ..... less than 1Ω

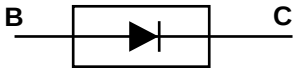
If the reading obtained are not stated as above, then the power transformer is probably faulty and should be replaced.

CARRY OUT 4R CHECKS.

C **HIGH VOLTAGE RECTIFIER ASSEMBLY TEST**

CARRY OUT 3D CHECKS.
Isolate the high voltage rectifier assembly from the HV circuit. The high voltage rectifier can be tested using an ohmmeter set to its highest range. Connect the ohmmeter across the terminal B+C of the high voltage rectifier and note the reading obtained. Reverse the meter leads and note this second reading. The normal resistance is infinite in one direction and more than 100 kΩ in the other direction.

CARRY OUT 4R CHECKS.



HIGH VOLTAGE RECTIFIER

NOTE: FOR MEASUREMENT OF THE RESISTANCE OF THE RECTIFIER, THE BATTERIES OF THE MEASURING INSTRUMENT MUST HAVE A VOLTAGE AT LEAST 6 VOLTS, BECAUSE OTHERWISE AN INFINITE RESISTANCE MIGHT BE SHOWN IN BOTH DIRECTIONS.

TEST PROCEDURES

PROCEDURE LETTER	COMPONENT TEST

D **HIGH VOLTAGE CAPACITOR TEST**

CARRY OUT 3D CHECKS.

A. Isolate the high voltage capacitor from the circuit.
B. Continuity check must be carried out with measuring instrument which is set to the highest resistance range.
C. A normal capacitor shows continuity for a short time (kick) and then a resistance of about 10MΩ after it has been charged.
D. A short-circuited capacitor shows continuity all the time.
E. An open capacitor constantly shows a resistance about 10 MΩ because of its internal 10MΩ resistance.
F. When the internal wire is opened in the high voltage capacitor shows an infinite resistance.
G. The resistance across all the terminals and the chassis must be infinite when the capacitor is normal.

If incorrect reading are obtained, the high voltage capacitor must be replaced.

CARRY OUT 4R CHECKS.

E **SWITCH TEST**

CARRY OUT 3D CHECKS.

Isolate the switch to be tested and using an ohmmeter check between the terminals as described in the following table.

Table: Terminal Connection of Switch

Plunger Operation	COM to NO	COM to NC
Released	Open circuit	Short circuit
Depressed	Short circuit	Open circuit

COM; Common terminal
NO; Normally open terminal
NC; Normally close terminal

If incorrect readings are obtained, make the necessary switch adjustment or replace the switch.

CARRY OUT 4R CHECKS.

F **THERMAL CUT-OUT TEST**

CARRY OUT 3D CHECKS.

Disconnect the leads from the terminals of the thermal cut-out. Then using an ohmmeter, make a continuity test across the two terminals as described in the table below.

CARRY OUT 4R CHECKS.

Table: Thermal cut-out Test

Parts Name	Temperature of "ON" condition (closed circuit) (˚C)	Temperature of "OFF" condition (open circuit) (˚C)	Indication ofohmmeter (When room temperature is approx. 20˚C)
Thermal cut-out 125˚C	This is not resetable type.	Above 125˚C	Closed circuit.
Thermal cut-out 95˚C	Below 75˚C	Above 95˚C	Closed circuit.

If incorrect readings are obtained, replace the thermal cut-out.

An open circuit thermal cut-out 95˚C (MG) indicates that the magnetron has overheated, this may be due to resistricted ventilation, cooling fan failure or a fault condition within the magnetron or HV circuit.

An open circuit thermal cut-out 125˚C (OVEN) indicates that the foods in the oven may catch fire, this may be due to over heating produced by improper setting of the cooking time or failure of the control panel.

G **MONITOR RESISTOR TEST**

CARRY OUT 3D CHECKS.

Disconnect the leads from the monitor resist. Using an ohmmeter and set on a low range. Check between the terminals of the monitor resistor.

The resistance of monitor resistor is approx. 0.8 ohms.

If incorrect readings are obtained, replace the monitor resistor. CARRY OUT 4R CHECKS.

TEST PROCEDURES

PROCEDURE LETTER	COMPONENT TEST

H **MOTOR WINDING TEST**

CARRY OUT 3D CHECKS.

Disconnect the leads from the motor.
Using an ohmmeter, check the resistance between the two terminals as described in the table below.

Table: Resistance of Motor

Motors	Resistance
Fan motor	Approximately 390 Ω
Turntable motor	Approximately 16.08 kΩ

If incorrect readings are obtained, replace the motor.

CARRY OUT 4R CHECKS.

I **BLOWN FUSE F M10A**

CARRY OUT 3D CHECKS.

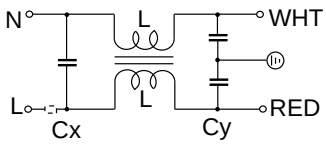
1. If the fuse M10A is blown, there could be shorts or ground in electrical parts or wire harness. Check them and replace the defective parts or repair the wire harness.
2. If the fuse M10A is blown when the door is opened, check the 1st. latch switch, 2nd. interlock relay, 2nd. interlock relay control switch, monitor switch and monitor resistor.
   If the fuse M10A is blown by incorrect door switching replace the defective switch(s) and the fuse M10A.

CARRY OUT 4R CHECKS.

CAUTION: ONLY REPLACE FUSE M8A WITH THE CORRECT VALUE REPLACEMENT.

J **NOISE FILTER TEST**

CARRY OUT 3D CHECKS.
Disconnect the leads from the terminals of the noise filter. Using an ohmmeter, check between the terminals as described in the following table.



MEASURING POINT	INDICATION OF OHMMETER
Between N and L	Open circuit
Between terminal N and WHITE	Short circuit
Between terminal L and RED	Short circuit

L (min)	Cx ± 20%	Cy ± 20%
600μH	0.068μF	0.0022μF

If incorrect readings are obtained, replace the noise filter unit.

CARRY OUT 4R CHECKS.

K **HIGH VOLTAGE FUSE TEST**

CARRY OUT 3D CHECKS.

If the high voltage fuse is blown, there could be a short in the high voltage rectifier or the magnetron. Check them and replace the defective parts and the high voltage fuse.

CARRY OUT 4R CHECKS.

CAUTION: ONLY REPLACE HIGH VOLTAGE FUSE WITH THE CORRECT VALUE REPLACEMENT.

TEST PROCEDURES

PROCEDURE LETTER	COMPONENT TEST

L **TOUCH CONTROL PANEL ASSEMBLY TEST**

The touch control panel consists of circuits including semiconductors such as LSI, ICs, etc. Therefore, unlike conventional microwave ovens, proper maintenance cannot be performed with only a voltmeter and ohmmeter. In this service manual, the touch control panel assembly is divided into two units, Control Unit and Key Unit, and also the Control Unit is divided into two units, CPU Unit and Power Unit, and troubleshooting by unit replacement is described according to the symptoms indicated.

1. Key Unit. Note: Check key unit ribbon connection before replacement.
   The following symptoms indicate a defective key unit. Replace the key unit.
   a) When touching the pads, a certain pad produces no signal at all.
   b) When touching a number pad, two figures or more are displayed.
   c) When touching the pads, sometimes a pad produces no signal.
2. Control Unit.
   The following symptoms indicate a defective control unit. Before replacing the control unit, perform the Key unit test (Procedure K) to determine if control unit is faulty.

2-1 In connection with pads.
   a) When touching the pads, a certain group of pads do not produce a signal.
   b) When touching the pads, no pads produce a signal.

2-2 In connection with indicators.
   a) At a certain digit, all or some segments do not light up.
   b) At a certain digit, brightness is low.
   c) Only one indicator does not light.
   d) The corresponding segments of all digits do not light up; or they continue to light up.
   e) Wrong figure appears.
   f) A certain group of indicators do not light up.
   g) The figure of all digits flicker.

2-3 Other possible troubles caused by defective control unit.
   a) Buzzer does not sound or continues to sound.
   b) Clock does not operate properly.
   c) Cooking is not possible.

M **KEY UNIT TEST**

If the display fails to clear when the STOP/CLEAR pad is depressed, first verify the flat ribbon cable is making good contact, verify that the door sensing switch (stop switch) operates properly; that is the contacts are closed when the door is closed and open when the door is open.
If the door sensing switch (stop switch) is good, disconnect the flat ribbon cable that connects the key unit to the control unit and make sure the door sensing switch is closed (either close the door or short the door sensing switch connector). Use the key unit matrix indicated on the control panel schematic and place a jumper wire between the pins that correspond to the STOP/CLEAR pad making momentary contact. If the control unit responds by clearing with a beep the key unit is faulty and must be replaced. If the control unit does not respond, it is faulty and must be replaced.
If a specific pad does not respond, the above method may be used (after clearing the control unit) to determine if the control unit or key pad is at fault.
CARRY OUT 3D CHECKS.

	G 8	G 7	G 6	G 5	G 4	G 3	G 2	G 1
G 9	5	4	3	2	1			
G10	0	9	8	7	6	BEVERAGE		
G11	INSTANT COOK START	DEFROST	JACKET POTATO	FRESH VEGETABLES	REHEAT PIE	REHEAT PIZZA		
G12	POWER LEVEL	TIMER CLOCK	REHEAT PORRIDGE	RICE	FROZEN VEGETABLES	STOP CLEAR		

TEST PROCEDURES

PROCEDURE LETTER	COMPONENT TEST

N **RELAY TEST**

Remove the outer case and check voltage between Pin No 3 of the 2-pin connector (A) and the common terminal of the relay RY2 on the power unit with an A.C. voltmeter. The meter should indicate 220 volts, if not check oven circuit.

RY1 and RY2 Relay Test
These relays are operated by D.C. voltage.
Check voltage at the relay coil with a D.C. voltmeter during the microwave cooking operation or convection cooking operation.

DC. voltage indicated ..... Defective relay.
DC. voltage not indicated ..... Check diode which is connected to the relay coil. If diode is good, control unit is defective.

RELAY SYMBOL	OPERATIONAL VOLTAGE	CONNECTED COMPONENTS
RY1	APPROX. 13.1V D.C.	Oven lamp / Turntable motor / Cooling fan motor
RY2	APPROX. 11.7V D.C.	Power transformer

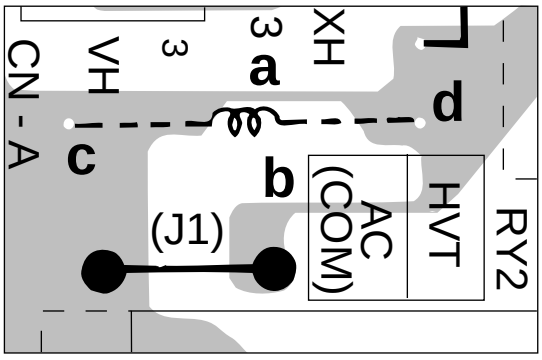
CARRY OUT 4R CHECKS.

O **PROCEDURES TO BE TAKEN WHEN THE FOIL PATTERN ON THE PRINTED WIRING BOARD (PWB) IS OPEN**

To protect the electronic circuits, this model is provided with a fine foil pattern added to the primary on the PWB, this foil pattern acts as a fuse. If the foil pattern is open, follow the troubleshooting guide given below for repair.
Problem: POWER ON, indicator does not light up.
CARRY OUT 3D CHECKS.

STEPS	OCCURRENCE	CAUSE OR CORRECTION
1	The rated AC voltage is not present between Pin No. 3 of the 2-pin connector (A) and the common terminal of the relay RY2.	Check supply voltage and oven power cord.
2	The rated AC voltage is present to primary side of low voltage transformer.	Low voltage transformer or secondary circuit defective. Check and repair.
3	Only pattern at "a" is broken.	*Insert jumper wire J1 and solder.
4	Pattern at "a" and "b" are broken.	*Insert the coil RCILF2003YAZZ between "c" and "d".

NOTE: *At the time of making these repairs, make a visual inspection of the varistor. Check for burned damage and examine the transformer with a tester for the presence of layer short-circuit (check the primary coil resistance). If any abnormal condition is detected, replace the defective parts.



CARRY OUT 4R CHECKS.

TOUCH CONTROL PANEL ASSEMBLY

OUTLINE OF TOUCH CONTROL PANEL

The touch control section consists of the following units.

(1) Key Unit
(2) Control Unit (The Control Unit consists of Power Unit and CPU Unit).

The principal functions of these units and the signals communicated among them are explained below.

Key Unit
The key unit is composed of a matrix, signals generated in the LSI are sent to the key unit through P20 - P26 and AN3. When a key pad is touched, a signal is completed through the key unit and passed back to the LSI through P44 - P47 to perform the function that was requested.

Control Unit
Control unit consists of LSI, ACL circuit, indicator circuit, power source circuit, relay circuit, buzzer circuit, synchronizing signal circuit and back light circuit.

1) ACL
This circuit generates a signal which resets the LSI to the initial state when power is supplied.

2) Indicator Circuit
This circuit consists of 25 segments and 4 common electrodes using a Liquid Crystal Display.

3) Power Source Circuit
This circuit generates voltages necessary in the control unit from the AC line voltage.
In addition, the synchronizing signal is available in order to compose a basic standard time in the clock circuit.

Symbol	Voltage	Application
VC	-5.1V	LSI(IC1)

4) Relay Circuit
A circuit to drive the magnetron, fan motor, turntable motor and light the oven lamp.

5) Buzzer Circuit
The buzzer is responds to signals from the LSI to emit audible sounds (key touch sound and completion sound).

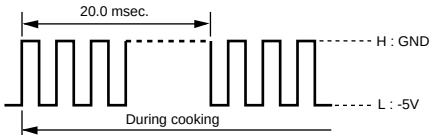
6) Synchronizing Signal Circuit
The power source synchronizing signal is available in order to compose a basic standard time in the clock circuit. It accompanies a very small error because it works on commercial frequency.

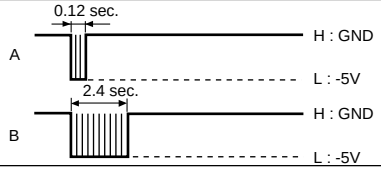
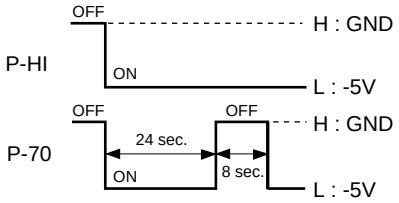
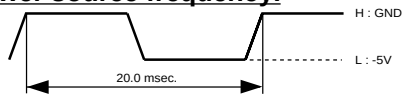
7) Door Sensing Switch
A switch to "tell" the LSI if the door is open or closed.

8) Back Light Circuit
A circuit to drive the back light (Light emitting diodes LD1 - LD5).

DESCRIPTION OF LSI

LSI(IZA813DR):
The I/O signal of the LSI(IZA813DR) is detailed in the following table.

Pin No.	Signal	I/O	Description
1-2	VL2-VL1	IN	**Power source voltage input terminal.** Standard voltage for LCD.
3-6	AN7-AN4	IN	**Terminal to change cooking input according to the Model.** By using the A/D converter contained in the LSI, DC voltage in accordance with the Model in operation is applied to set up its cooking constant.
7	AN3	OUT	**Key strobe signal.** Signal applied to touch-key section. A pulse signal is input to P44 - P47 terminal while one of G1 line keys on key matrix is touched.
8	AN2	IN	**To input signal which communicates the door open/close information to LSI.** Door closed "H" level signal (0V). Door opened "L" level signal (-5V)
9-10	P61-P60	OUT	Terminal not used.
11	P57	OUT	Terminal not used.
12	P56	OUT	**Oven lamp, fan motor and turntable motor driving signal.** To turn on and off shut off relay (RY1). The square waveform voltage is delivered to the RY1 driving circuit and RY2 control circuit. 

Pin No.	Signal	I/O	Description
13	P55	OUT	Terminal not used.
14	P54	OUT	**Signal to sound buzzer (2.0 kHz).** A: key touch sound. B: Completion sound. 
15	P53	OUT	**Magnetron high-voltage circuit driving signal.** To turn on and off the cook relay (RY2). The signals holds "L" level during microwave cooking and "H" level while not cooking. In other cooking modes (variable cooking) the signal turns to "H" level and "L" level in repetition according to the power level.  (ON and OFF times for other power level.)
16-18	P52-P50	OUT	Terminal not used.
19	P47	IN	**Signal coming from touch key.** When either G12 line on key matrix is touched, a corresponding signal out of AN3 and P20 - P26 will be input into P47. When no key is touched, the signal is held at "H" level.
20	P46	IN	**Signal similar to P47.** When either G11 line on key matrix is touched, a corresponding signal will be input into P46.
21	P45	IN	**Signal similar to P47.** When either G10 line on key matrix is touched, a corresponding signal will be input into P45.
22	P44	IN	**Signal similar to P47.** When either G9 line on key matrix is touched, a corresponding signal will be input into P44.
23	P43	OUT	Terminal not used.
24	INT0	IN	**Signal synchronized with commercial power source frequency.** This is the basic timing for time processing of LSI. 
25	P41	OUT	Terminal not used.
26	P40	IN	Connected to VC.
27	RESET	IN	**Auto clear terminal.** Signal is input to reset the LSI to the initial state when power is applied. Temporarily set to "L" level the moment power is applied, at this time the LSI is reset. Thereafter set at "H" level.
28-29	P71-P70	OUT	Terminal not used.
30	XIN	OUT	**Internal clock oscillation frequency input setting.** The internal clock frequency is set by inserting the ceramic filter oscillation circuit with respect to XIN terminal.
31	XOUT	OUT	**Internal clock oscillation frequency control output.** Output to control oscillation input of XOUT.
32	VSS	IN	**Power source voltage: -5.0V.** VC voltage of power source circuit input.
33	P27	OUT	Terminal not used.
34	P26	OUT	**Key strobe signal.** Signal applied to touch-key section. A pulse signal is input to P44 - P47 terminal while one of G8 line keys on key matrix is touched.
35	P25	OUT	**Key strobe signal.** Signal applied to touch-key section. A pulse signal is input to P44 - P47 terminal while one of G7 line keys on key matrix is touched.

Pin No.	Signal	I/O	Description
36	P24	OUT	**Key strobe signal.** Signal applied to touch-key section. A pulse signal is input to P44 - P47 terminal while one of G6 line keys on key matrix is touched.
37	P23	OUT	**Key strobe signal.** Signal applied to touch-key section. A pulse signal is input to P44 - P47 terminal while one of G5 line keys on key matrix is touched.
38	P22	OUT	**Key strobe signal.** Signal applied to touch-key section. A pulse signal is input to P44 - P47 terminal while one of G4 line keys on key matrix is touched.
39	P21	OUT	**Key strobe signal.** Signal applied to touch-key section. A pulse signal is input to P44 - P47 terminal while one of G3 line keys on key matrix is touched.
40	P20	OUT	**Key strobe signal.** Signal applied to touch-key section. A pulse signal is input to P44 - P47 terminal while one of G2 line keys on key matrix is touched.
41-44	P17-P14	OUT	Terminal not used.
45-47	P13-P11	OUT	**Segment data signal.** Connected to LCD. The relation between signals are as follows: LSI signal (Pin No.) LCD (Pin No.) LSI signal (Pin No.) LCD (Pin No.) P13 (45) ..... S16 (25) SEG 13 (59) ..... S20 (12) P12 (46) ..... S15 (24) SEG 11 (61) ..... S21 (11) P11 (47) ..... S14 (23) SEG 10 (62) ..... S22 (10) SEG 24 (48) ..... S13 (22) SEG 9 (63) ..... S23 (9) SEG 23 (49) ..... S12 (21) SEG 8 (64) ..... S24 (8) SEG 22 (50) ..... S11 (20) SEG 7 (65) ..... S25 (7) SEG 21 (51) ..... S10 (19) SEG 6 (66) ..... S26 (6) SEG 19 (53) ..... S9 (18) SEG 5 (67) ..... S 4 (5) SEG 18 (54) ..... S8 (17) SEG 3 (69) ..... S 3 (4) SEG 17 (55) ..... S7 (16) SEG 2 (70) ..... S 2 (3) SEG 16 (56) ..... S6 (15) SEG 1 (71) ..... S 1 (2) SEG 15 (57) ..... S5 (14) SEG 0 (72) ..... S 0 (1) SEG 14 (58) S19 (13)
48-51	SEG24-SEG21	OUT	**Segment data signal.** Signal similar to P13.
52	SEG20	OUT	Terminal not used.
53-59	SEG19-SEG13	OUT	**Segment data signal.** Signal similar to P13.
60	SEG12	OUT	Terminal not used.
61-67	SEG11-SEG5	OUT	**Segment data signal.** Signal similar to P13.
68	SEG4	OUT	Terminal not used.
69-72	SEG3-SEG0	OUT	**Segment data signal.** Signal similar to P13.
73/74	VCC/VREF	IN	Connected to GND.
75	AVSS	IN	Connected to VC.
76	COM3	OUT	**Common data signal: COM3.** Connected to LCD signal C3 (Pin No. 29)
77	COM2	OUT	**Common data signal: COM2.** Connected to LCD signal C2 (Pin No. 28)
78	COM1	OUT	**Common data signal: COM1.** Connected to LCD signal C1 (Pin No. 27)
79	COM0	OUT	**Common data signal: COM0.** Connected to LCD signal C0 (Pin No. 26)
80	VL3	IN	**Power source voltage input terminal.** Standard voltage for LCD.

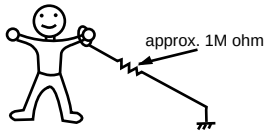
SERVICING

1. Precautions for Handling Electronic Components

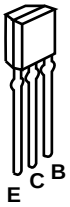
This unit uses CMOS LSI in the integral part of the circuits. When handling these parts, the following precautions should be strictly followed. CMOS LSI have extremely high impedance at its input and output terminals. For this reason, it is easily influenced by the surrounding high voltage power source, static electricity charge in clothes, etc, and sometimes it is not fully protected by the built-in protection circuit.

In order to protect CMOS LSI.

1) When storing and transporting, thoroughly wrap them in aluminium foil. Also wrap all PW boards containing them in aluminium foil.
2) When soldering, ground the technician as shown in the figure and use grounded soldering iron and work table.



2. Shapes of Electronic Components



Transistor
2SA933S
KRC243M

3. Servicing of Touch Control Panel

We describe the procedures to permit servicing of the touch control panel of the microwave oven and the precautions you must take when doing so. To perform the servicing, power to the touch control panel is available either from the power line of the oven itself or from an external power source.

(1) Servicing the touch control panel with power supply of the oven:

CAUTION:

THE HIGH VOLTAGE TRANSFORMER OF THE MICROWAVE OVEN IS STILL LIVE DURING SERVICING PRESENTS A HAZARD.

Therefore, when checking the performance of the touch control panel, put the outer cabinet on the oven to avoid touching the high voltage transformer, or unplug the primary terminal (connector) of the high voltage transformer to turn it off; the end of such connector must be insulated with an insulating tape. After servicing, be sure to replace the leads to their original locations.

A. On some models, the power supply cord between the touch control panel and the oven itself is so short that the two can't be separated.

For those models, check and repair all the controls (sensor-related ones included) of the touch control panel while keeping it connected to the oven.

B. On some models, the power supply cord between the touch control panel and the oven proper is long enough that they may be separated from each other. For those models, therefore, it is possible to check and repair the controls of the touch control panel while keeping it apart from the oven proper; in this case you must short both ends of the door sensing switch (on PWB) of the touch control panel with a jumper, which brings about an operational state that is equivalent to the oven door being closed. As for the sensor-related controls of the touch control panel, checking them is possible if dummy resistor(s) with resistance equal to that of the controls are used.

(2) Servicing the touch control panel with power supply from an external power source:

Disconnect the touch control panel completely from the oven proper, and short both ends of the door sensing switch (on PWB) of the touch control panel, which brings about an operational state that is equivalent to the oven door being closed. Connect an external power source to the power input terminal of the touch control panel, then it is possible to check and repair the controls of the touch control panel it is also possible to check the sensor-related controls of the touch control panel by using the dummy resistor(s).

4. Servicing Tools

Tools required to service the touch control panel assembly.

1) Soldering iron: 30W
   (It is recommended to use a soldering iron with a grounding terminal.)
2) Oscilloscope: Single beam, frequency range: DC - 10MHz type or more advanced model.
3) Others: Hand tools

5. Other Precautions

1) Before turning on the power source of the control unit, remove the aluminium foil applied for preventing static electricity.
2) Connect the connector of the key unit to the control unit being sure that the lead wires are not twisted.
3) After aluminium foil is removed, be careful that abnormal voltage due to static electricity etc. is not applied to the input or output terminals.
4) Attach connectors, electrolytic capacitors, etc. to PWB, making sure that all connections are tight.
5) Be sure to use specified components where high precision is required.

COMPONENT REPLACEMENT AND ADJUSTMENT PROCEDURE

WARNING: Avoid possible exposure to microwave energy. Please follow the instructions below before operating the oven.

1. CARRY OUT 3D CHECKS.
2. Make sure that a definite" click" can be heard when the microwave oven door is unlatched. (Hold the door in a closed position with one hand, then push the door open button with the other, this causes the latch leads to rise, it is then possible to hear a "click' as the door switches operate.)
3. Visually check the door and cavity face plate for damage (dents, cracks, signs of arcing etc.).

Carry out any remedial work that is necessary before operating the oven.
Do not operate the oven if any of the following conditions exist;

1. Door does not close firmly.
2. Door hinge, support or latch hook is damaged.
3. The door gasket or seal or damaged.
4. The door is bent or warped.
5. There are defective parts in the door interlock system.
6. There are defective parts in the microwave generating and transmission assembly.
7. There is visible damage to the oven.

Do not operate the oven:
1. Without the RF gasket (Magnetron).
2. If the wave guide or oven cavity are not intact.
3. If the door is not closed.
4. If the outer case (cabinet) is not fitted.

Please refer to 'OVEN PARTS, CABINET PARTS, CONTROL PANEL PARTS, DOOR PARTS', when carrying out any of the following removal procedures:

WARNING FOR WIRING

To prevent an electric shock, take the following manners.
1. Before wiring,
   1) Disconnect the power supply.
   2) Open the door and wedge the door open.
   3) Discharge the high voltage capacitor and wait for 60 seconds.
2. Don't let the wire leads touch to the following parts;
   1) High voltage parts:
      Magnetron, High voltage transformer, High voltage capacitor and High voltage rectifier assembly.
   2) Hot parts:
      Oven lamp, Magnetron, High voltage transformer and Oven cavity.
   3) Sharp edge:
      Bottom plate, Oven cavity, Weveguide flange, Chassis support and other metallic plate.
   4) Movable parts (to prevent a fault)
      Fan blade, Fan motor, Switch, Switch lever, Open button.
3. Do not catch the wire leads in the outer case cabinet.
4. Insert the positive lock connector certainly until its pin is locked. And make sure that the wire leads should not come off even if the wire leads is pulled.
5. To prevent an error function, connect the wire leads correctly, referring to the Pictorial Diagram.

OUTER CASE REMOVAL

To remove the components, procedure as follows.
1. Disconnect oven from power supply.
2. Remove four(4) screws from rear and one (1) screw along the right side edge of case.
3. Slide the entire case back out about 1 inch(3 cm) to free it from retaining clips on the cavity face plate.
4. Lift entire case from the unit.

CAUTION: DISCONNECT OVEN FROM POWER SUPPLY BEFORE REMOVING OUTER CASE.

POWER TRANSFORMER REMOVAL

1. CARRY OUT 3D CHECKS.
2. Disconnect wire leads from power transformer, magnetron and capacitor terminals.
3. Remove four (4) screws holding transformer to bottom plate right.
4. Remove transformer from bottom plate right.

Re-install
1. Rest transformer on the bottom plate right with its primary terminals toward the oven face plate.
2. Secure transformer with four screws to bottom plate right.
3. Re-connect wire leads (primary and high voltage) to power transformer and filament leads of transformer to magnetron and high voltage capacitor. Refer to "PICTORIAL DIAGRAM".
4. Re-install outer case and check that oven is operating properly.

HIGH VOLTAGE RECTIFIER, HIGH VOLTAGE FUSE AND HIGH VOLTAGE CAPACITOR

REMOVAL

1. CARRY OUT 3D CHECKS.
2. Disconnect the brown and blue wires of power supply cord from the noise filter.
3. Disconnect the connector of the main wire harness from the noise filter.
4. Remove one (1) screw holding the noise filter angle to the oven cavity rear plate.
5. Remove one the noise filter angle with noise filter from the oven cavity rear plate.
6. Disconnect the high voltage fuse from the power transformer.
7. Remove one (1) screw holding capacitor holder to the oven cavity rear plate.
8. Remove one (1) screw holding high voltage rectifier assembly to capacitor holder.
9. Disconnect rectifier terminal from capacitor.
10. Disconnect wire leads and high voltage fuse from capacitor and remove capacitor holder.
11. High voltage rectifier assembly, high voltage fuse and high voltage capacitor are free now.

CAUTION: WHEN REPLACING HIGH VOLTAGE RECTIFIER AND HIGH VOLTAGE CAPACITOR, GROUND SIDE TERMINAL OF THE HIGH VOLTAGE RECTIFIER MUST BE SECURED FIRMLY WITH A GROUNDING SCREW.

MAGNETRON REMOVAL

Removal

1. CARRY OUT 3D CHECKS.
2. Disconnect wire leads from magnetron.
3. Remove the two (2) screws holding chassis support to oven cavity front plate and magnetron.
4. Remove the chassis support from oven.
5. Carefully remove the two (2) screws holding magnetron to waveguide flange.
6. Lift up magnetron with care so that magnetron antenna is not hit by any metal object around antenna.
7. Now, the magnetron is free.

Re-install

1. Re-install the magnetron to waveguide flange with the two (2) screws diagonally as shown in Figure C-1.
2. Insert the two (2) tabs of the chassis support to the oven cavity front plate and back plate.
3. Re-install the chassis support to oven cavity front plate and magnetron with the two (2) screws.
4. Reconnect the wire leads to the magnetron. Refer to "PICTORIAL DIAGRAM".
5. Re-install outer case and check that the oven is operating properly.

CAUTION: WHEN REPLACING MAGNETRON, BE SURE THE R.F. GASKET IS IN PLACE AND MOUNTING SCREWS ARE TIGHTENED SECURELY.

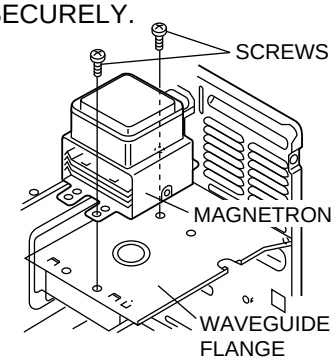


Figure C-1. Magnetron replacement

POSITIVE LOCK® CONNECTOR REMOVAL

1. CARRY OUT 3D CHECKS.
2. Pushing the lever of positive lock® connector.
3. Pull out the positive lock® connector.

CAUTION: WHEN YOU (SERVICE ENGINEERS) CONNECT THE POSITIVE LOCK® CONNECTORS TO THE TERMINALS, CONNECT THE POSITIVE LOCK® SO THAT THE LEVER FACE YOU (SERVICE ENGINEERS).

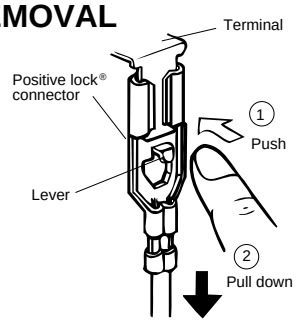
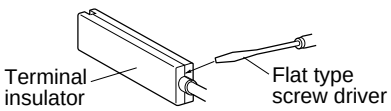


Figure C-2. Positive lock® connector

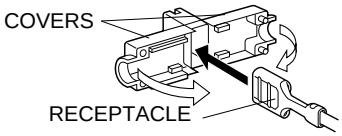
TERMINAL INSULATOR REPLACEMENT

1. Open covers of the terminal insulator by using small flat type screw driver.
2. Remove the receptacle from the terminal insulator.
3. Now, the terminal insulator is free.



Installation

1. Insert the receptacle into terminal insulator.
2. Close covers of the terminal insulator, as shown illustlated below.



CONTROL PANEL ASSEMBLY REMOVAL

1. CARRY OUT 3D CHECKS.
2. Disconnect the wire leads from panel components.
3. Make one (1) tab of the oven cavity front plate straight holding the control panel assembly to the oven flange.
4. Slide the control panel assembly upward and remove it.
5. Now, individual components can be removed.

NOTE: 1. Before attaching a new key unit, wipe off remaining adhesive on the control panel frame surfaces completely with a soft cloth soaked in alcohol.
2. When attaching the key unit to the control panel frame, adjust the upper edge and right edge of the key unit to the correct position of control panel frame.
3. Stick the key unit firmly to the control panel frame by rubbing with soft cloth not to scratch.

CPU UNIT AND POWER UNIT

NOTE: When soldering the CPU unit and the power unit, make sure both the CPU unit and power unit are parallel, as shown figure C-3.

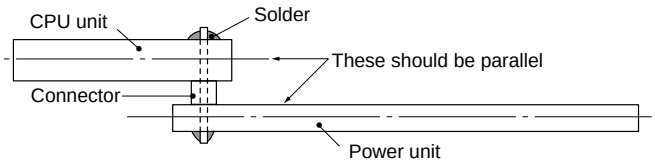


Figure C-3. Side view of CPU unit and Power unit

Handle the CPU unit carefully so that the ribbon cable does not come off. Because the ribbon cable is sticked on the LCD and the printed wiring board only by heated paste.

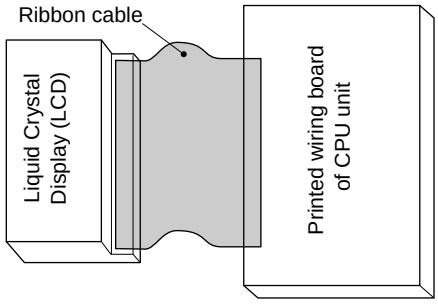


Figure C-4. CPU unit

OVEN LAMP AND LAMP SOCKET REMOVAL

1. CARRY OUT 3D CHECKS.
2. Bend the tab of the partition angle holding the lamp socket.
3. Lift up the oven lamp socket.
4. Pull the wire leads from the oven lamp socket by pushing the terminal hole of the oven lamp socket with the small flat type screw driver.
5. Now, the oven lamp socket is free.

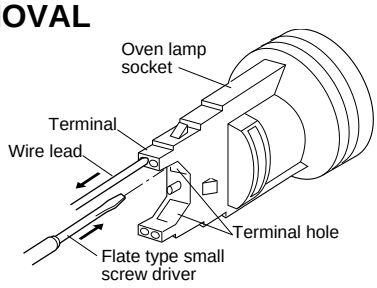


Figure C-5. Oven lamp socket

TURNTABLE MOTOR REMOVAL

1. Disconnect oven from power supply.
2. Remove turntable and turntable support from oven cavity.
3. Lay the oven on it's backside. Remove the turntable motor cover by snipping off the material in four corner.
4. Where the corners have been snipped off bend corner areas flat. No sharp edge must be evident after removal of the turntable motor cover.
5. Disconnect wire leads from turntable motor. (See "Positive lock connector removal")
6. Remove two (2) screws holding turntable motor to oven cavity.
7. Now the turntable motor is free.
8. After replacement use the one (1) screw to fit the turntable motor cover.

NOTE: The one (1) screw to fit the turntable motor cover should be XFPSD40P12K00, XFPSD40P10K00 or XFPSD40P08K00.

COOLING FAN MOTOR REMOVAL

1. CARRY OUT 3D CHECKS.
2. Disconnect the wire leads from the fan motor.
3. Remove two (2) screws holding the chassis support to magnetron and oven cavity front plate. And remove chassis support.
4. Release the snap of the main wire harness from the fan duct.
5. Remove two (2) screws holding the fan duct assembly to the oven cavity top and front plates.
6. Release the main wire harness from the hole of the fan duct.
7. Release the fan duct from the waveguide flange.
8. Release the fan duct assembly from the oven cavity.
9. Remove the fan blade from the fan motor shaft according the following procedure.

1) Hold the edge of the rotor of the fan motor by using a pair of grove joint pliers.

CAUTION:

- **Make sure that any pieces do not enter the gap between the rotor and the stator of the fan motor because the rotor is easily shaven by pliers and metal pieces may be produced.**
- **Do not touch the pliers to the coil of the fan motor because the coil may be cut or injured.**

*** Do not disfigure the bracket by touching with the pliers.**

2) Remove the fan blade from the shaft of the fan motor by pulling and rotating the fan blade with your hand.
3) Now, the fan blade will be free.

CAUTION:

*** Do not reuse the removed fan blade because the hole (for shaft) may be larger than normal.**

10. Remove the two (2) screws holding the fan motor to the fan duct.
11. Now, the fan motor is free.

INSTALLATION

1. Install the fan motor to the fan duct with the two (2) screws.
2. Install the fan blade to the fan motor shaft according the following procedure.

1) Hold the center of the bracket which supports the shaft of the fan motor on the flat table.
2) Apply the screw lock tight into the hole (for shaft) of the fan blade.
3) Install the fan blade to the shaft of fan motor by pushing the fan blade with a small, light weight, ball peen hammer or rubber mallet.

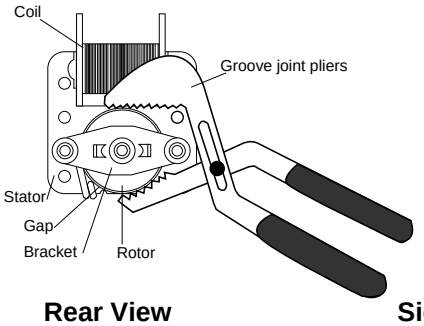
CAUTION:

*** Do not hit the fan blade strongly when installed because the bracket may be disfigured.**

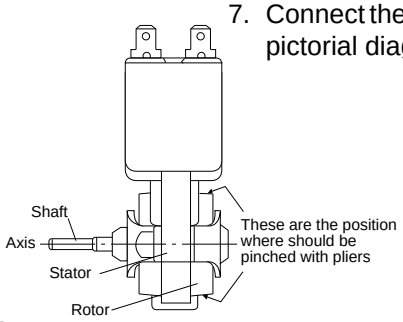
*** Make sure that the fan blade rotates smooth after installation.**

*** Make sure that the axis of the shaft is not slanted.**

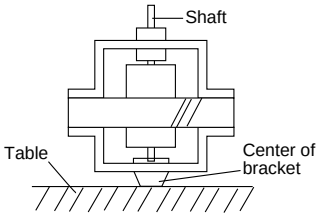
3. Catch three holes of fan duct on three tabs of the waveguide flange.
4. Install the fan duct assembly to the oven cavity top and front plate with the two (2) screws.
5. Insert the snap of the main wire harness to the hole of the fan duct and insert the main wire harness into the hole of the fan duct.
6. Install one (1) tab of the chassis support to oven cavity front plate and install another tab of it to rear plate. And then screw chassis support to magnetron and oven cavity front plate with two (2) screws.
7. Connect the wire leads to the fan motor, referring to the pictorial diagram.



Rear View



Side View



POWER SUPPLY CORD REPLACEMENT

Removal

1. CARRY OUT 3D CHECKS.
2. Disconnect the brown and blue wires of the power supply cord from the noise filter.
3. Remove the single (1) screw holding the earth wire of power supply cord.
4. Remove the power supply cord from the oven cavity back plate.

Re-install

1. Insert the power supply cord into the oven cavity back plate.
2. Connect the brown and blue wires of power supply cord into the terminals of noise filter, referring to pictorial diagram.
3. Re-install the earth wire to bottom plate with one (1) screw.
4. CARRY OUT 4R CHECKS.

Note : Step 4 above is important, and it must be done after replacing power supply cord.

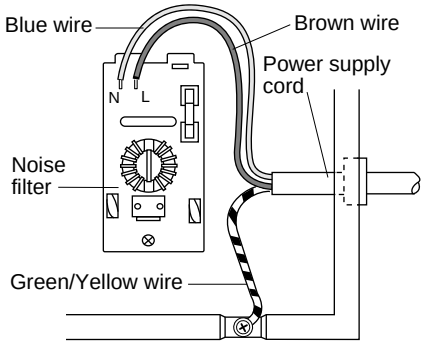


Figure C-6. Power supply cord replacement

1ST. LATCH SWITCH, 2ND. LATCH SWITCH, STOP SWITCH AND MONITOR SWITCH REMOVAL

1. CARRY OUT 3D CHECKS.
2. Disconnect wire leads from the switches.
3. Remove two (2) screws holding latch hook to oven flange.
4. Remove latch hook assembly from oven flange.
5. Push outward on the two (2) retaining tabs holding switch in place.
6. Switch is now free. At this time switch lever will be free, do not lose it.

Re-install

1. Re-install each switch lever and latch switch in its place. The 1st. latch /stop/monitor switches are in the lower position and the 2nd. latch switch is in the upper position.
2. Re-connect wire leads to each switch. Refer to pictorial diagram.
3. Secure latch hook (with two (2) mounting screws) to oven flange.
4. Make sure that the monitor switch is operating properly and check continuity of the monitor circuit. Refer to chapter "Test Procedure" and Adjustment procedure.

1ST. LATCH SWITCH, 2ND. INTERLOCK RERAY CONTROL SWITCH AND MONITOR SWITCH ADJUSTMENT

If each switch does not operate properly due to a misadjustment, the following adjustment should be made.

1. Loosen the two (2) screws holding latch hook to the oven cavity front flange.
2. With door closed, adjust latch hook by moving it back and forth, and up and down. In and out play of the door allowed by the upper and lower position of the latch hook should be less than 0.5mm. The vertical position of the latch hook should be adjusted so that the 1st. latch switch 2nd. interlock relay control switch are activated with the door closed. The horizontal position of the latch hook should be adjusted so that the monitor switch is activated with the door closed.
3. Secure the screws with washers firmly.
4. Check the operation of all switches. If any switch has not activated with the door closed, loosen screw and adjust the latch hook position.

After adjustment, check the following.

1. In and out play of door remains less than 0.5mm when in the latched position. First check upper position of latch hook, pushing and pulling upper portion of door toward the oven face. Then check lower portion of the latch hook, pushing and pulling lower portion of the door toward the oven face. Both results (play in the door) should be less than 0.5mm.
2. The 1st. latch switch and 2nd. interlock relay control switch interrupt the circuit before the door can be opened.
3. Monitor switch contacts close when door is opened.
4. Re-install outer case and check for microwave leakage around door with an approved microwave survey meter. (Refer to Microwave Measurement Procedure.)

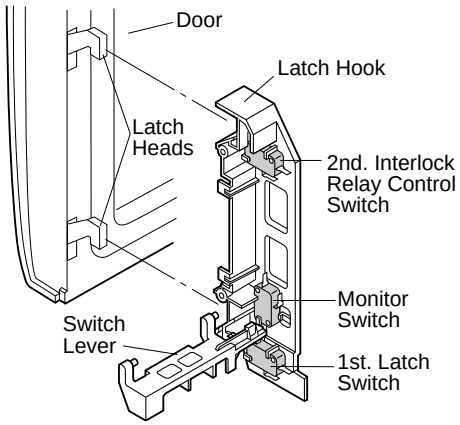


Figure C-7. Latch Switch Adjustments

DOOR REPLACEMENT

REMOVAL

1. Disconnect oven from power supply.
2. Push the open button and open the door slightly.
3. Insert an putty knife (thickness of about 0.5mm) into the gap between the door stopper and the choke cover to free engaging parts as shown in Figure C-8.
4. Try the principles of the lever and lift up the door stopper.
5. Now, the door stopper is free from the door assembly.
6. Release two (2) pins of door panel from two (2) holes of upper and lower oven hinges by lifting up.
7. Now, door panel with door frame is free from oven cavity.
8. Insert an putty knife (thickness of about 0.5mm) into the gap between the choke cover and door frame as shown in Figure C-8 to free engaging parts.
9. Try the principles of the lever and lift up the choke cover by inserting a putty knife as shown Figure C-8.
10. Release choke cover from door panel.
11. Now choke cover is free.

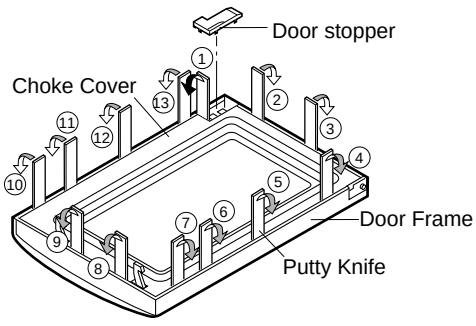
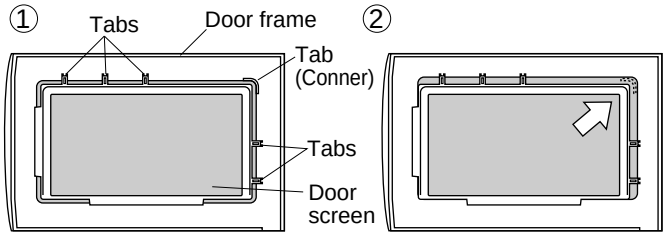


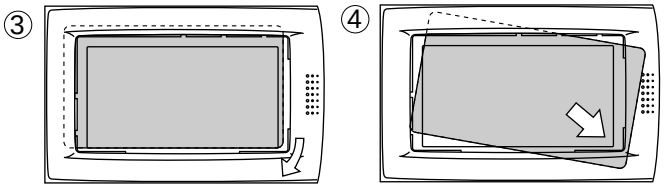
Figure C-8. Door Disassembly

12. Release door panel from nine (9) tabs of door frame by sliding door panel downward.
13. Now, door panel with sealer film is free.
14. Tear sealer film from door panel.
15. Now, door panel is free.
16. Slide latch head upward and remove it from door frame with releasing latch spring from door frame and latch head.
17. Now, latch head and latch spring are free.
18. Remove door screen from door frame as follows.
    1) Turn the door frame over. Refer to Figure 1 .
    2) Push the upper right cover of the door screen by your finger from the front side of the door frame. And slide the door screen over the corner tab until the upper and right edges of the door screen touch the tabs of the door frame. Refer to Figure 2 .



View; back side of door frame

    3) Turn the door frame back. Refer to Figure 3 .
    4) Push the lower right corner of the door screen by your finger from the back side of the door frame. And slide the door screen clockwise. Refer to Figure 3 .
    5) Pull out the door screen toward the lower right corner of the door frame. Refer to Figure 4 .



View; front side of door frame

19. Now, door screen is free.

RE-INSTALL

1. Re-install door screen to door frame by reversing the procedure of item 18 of "REMOVAL".
2. Re-install the latch spring to the latch head. Re-install the latch spring to the door frame. Re-install latch head to door frame.
3. Re-install door panel to door frame by fitting nine (9) tabs of door frame to nine (9) holes of door panel.
4. Hold the door panel to the door frame by sliding the door panel upward.
5. Put sealer film on door panel. Refer to “Sealer Film” about how to handle new one.
6. Re-install choke cover to door panel by pushing.
7. Catch two (2) pins of door panel on two (2) hole of upper and lower oven hinges.
8. Re-install the door stopper to the door assembly.

Note: After any service to the door;

(A) Make sure that door sensing switch and secondary interlock switch are operating properly. (Refer to chapter “Test Procedures”.).

(B) An approved microwave survey meter should be used to assure compliance with proper microwave radiation emission limitation standards.

After any service, make sure of the following :

1. Door latch heads smoothly catch latch hook through latch holes and that latch head goes through center of latch hole.
2. Deviation of door alignment from horizontal line of cavity face plate is to be less than 1.0mm.
3. Door is positioned with its face pressed toward cavity face plate.
4. Check for microwave leakage around door with an approved microwave survey meter. (Refer to Microwave Measurement Procedure.)

Note: The door on a microwave oven is designed to act as an electronic seal preventing the leakage of microwave energy from oven cavity during cook cycle. This function does not require that door be air-tight, moisture (condensation)-tight or light-tight. Therefore, occasional appearance of moisture, light or sensing of gentle warm air movement around oven door is not abnormal and do not of themselves indicate a leakage of microwave energy from oven cavity.

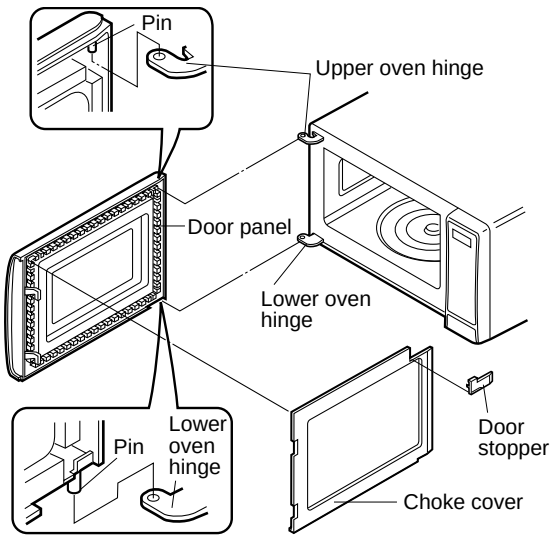


Figure C-9. Door Replacement

SEALER FILM

Installation

1. Put the adhesive tape on the backing film of the sealer film as shown in Fig. C-10.
2. Tear the backing film by pulling the adhesive tape.
3. Put the pasted side of the sealer film on the door panel

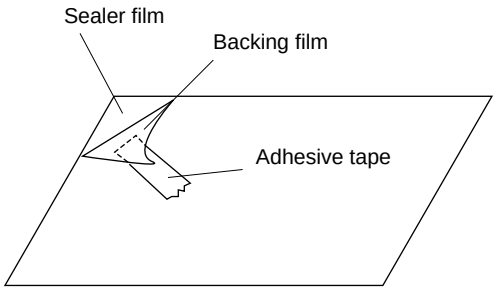


Figure C-10. Sealer film

MICROWAVE MEASUREMENT

After adjustment of door latch switches, monitor switch and door are completed individually or collectively, the following leakage test must be performed with a survey instrument and it must be confirmed that the result meets the requirements of the performance standard for microwave oven.

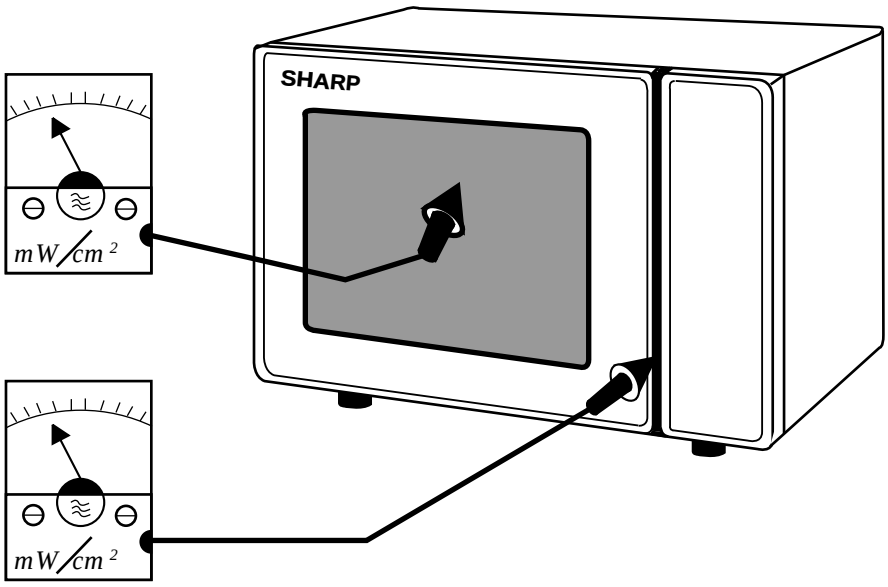
REQUIREMENT

The safety switch must prevent microwave radiation emission in excess of 5mW/cm2 at any point 5cm or more from external surface of the oven.

PREPARATION FOR TESTING:

Before beginning the actual test for leakage, proceed as follows;

1. Make sure that the test instrument is operating normally as specified in its instruction booklet.
   Important:
   Survey instruments that comply with the requirement for instrumentations as prescribed by the performance standard for microwave ovens must be used for testing.
   Recommended instruments are:
   NARDA 8100
   NARDA 8200
   HOLADAY HI 1500
   SIMPSON 380M
2. Place the oven tray into the oven cavity.
3. Place the load of 275 ± 15ml of water initially at 20 ± 5˚C in the centre of the oven tray. The water container should be a low form of 600 ml beaker with inside diameter of approx. 8.5cm and made of an electrically non-conductive material such as glass or plastic.
   The placing of this standard load in the oven is important not only to protect the oven, but also to insure that any leakage is measured accurately.
4. Close the door and turn the oven ON with the timer set for several minutes. If the water begins to boil before the survey is completed, replace it with 275ml of cool water.
5. Move the probe slowly (not faster that 2.5cm/sec.) along the gap.
6. The microwave radiation emission should be measured at any point of 5cm or more from the external surface of the oven.



Microwave leakage measurement at 5 cm distance

SCHEMATIC
NOTE: CONDITION OF OVEN
1. DOOR CLOSED
2. CLOCK APPEARS ON DISPLAY

NOTE: "★" indicates components with potentials above 250V.

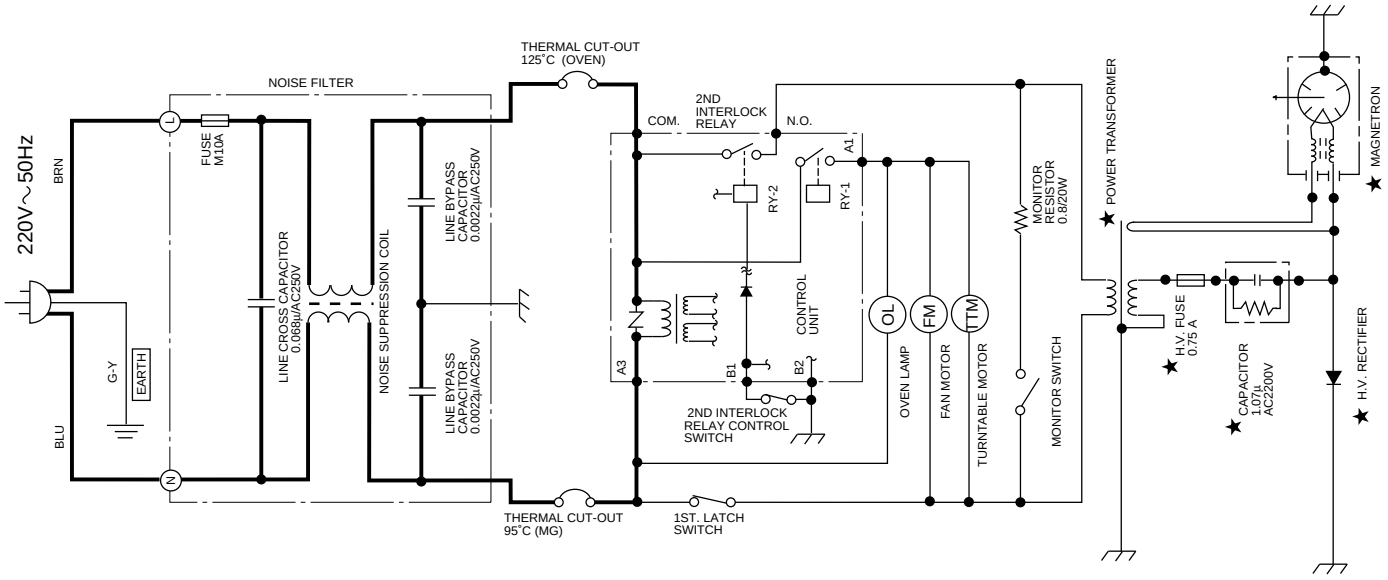


Figure O-1. Oven Schematic-OFF Condition

SCHEMATIC
NOTE: CONDITION OF OVEN
1. DOOR CLOSED
2. COOKING TIME PROGRAMMED
3. START KEY TOUCHED

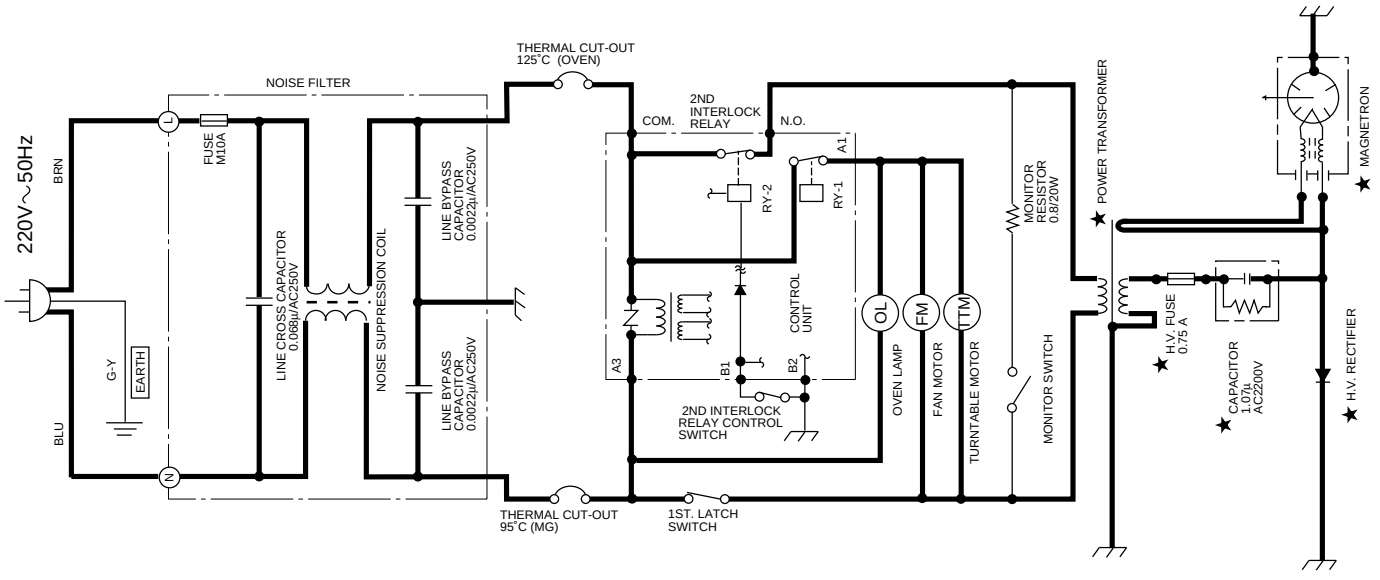


Figure O-2. Oven Schematic-Cooking Condition

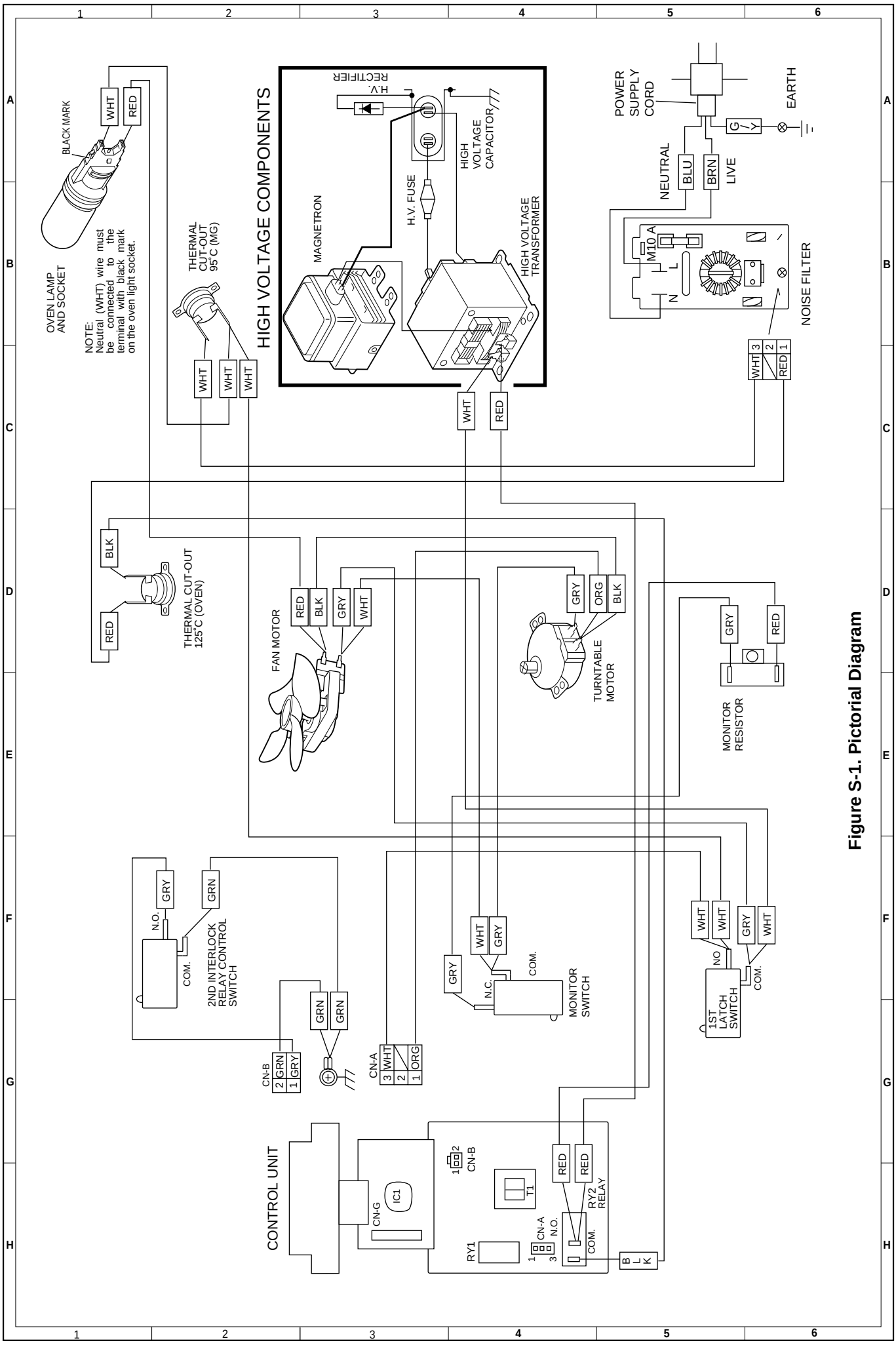


Figure S-1. Pictorial Diagram

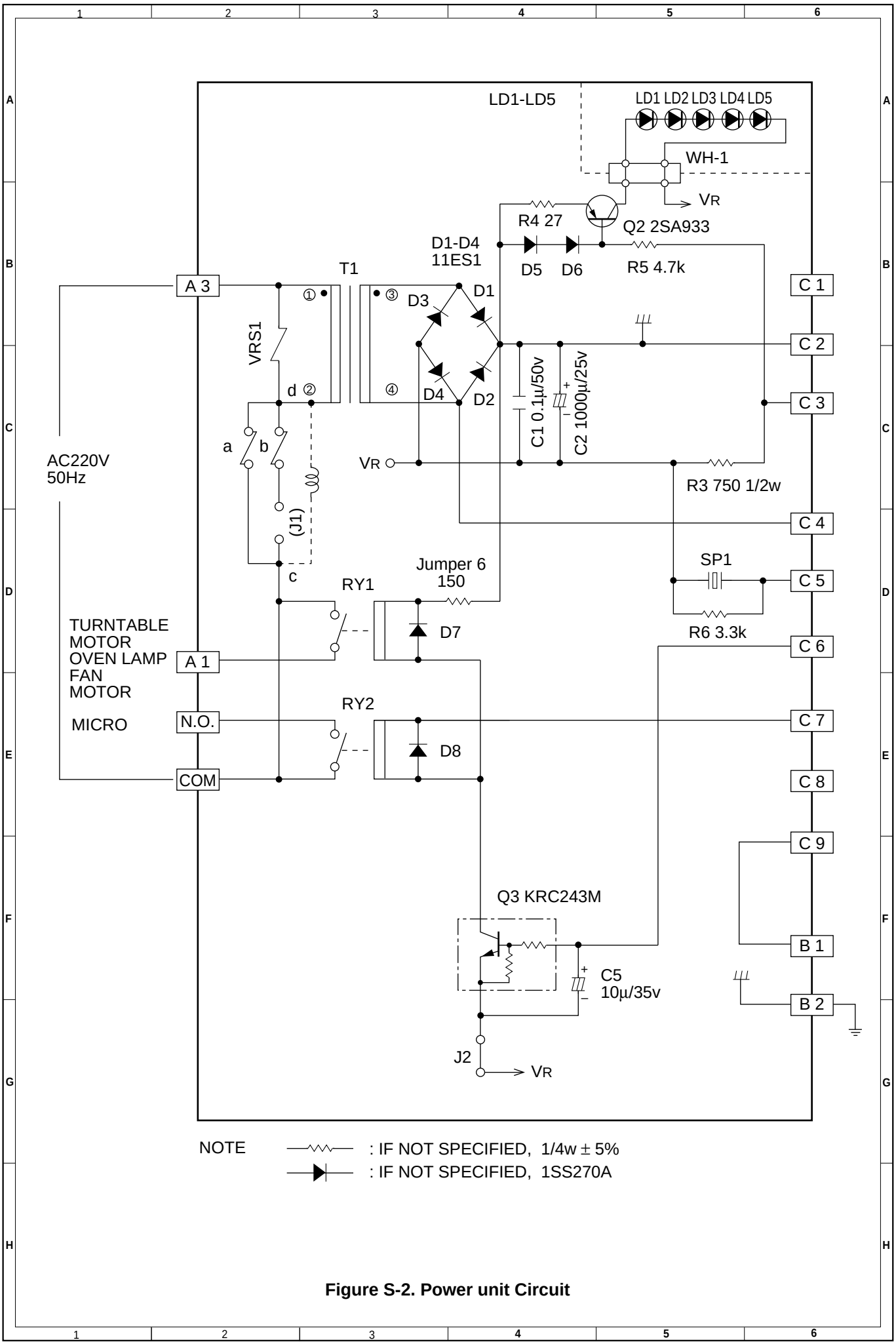


Figure S-2. Power unit Circuit

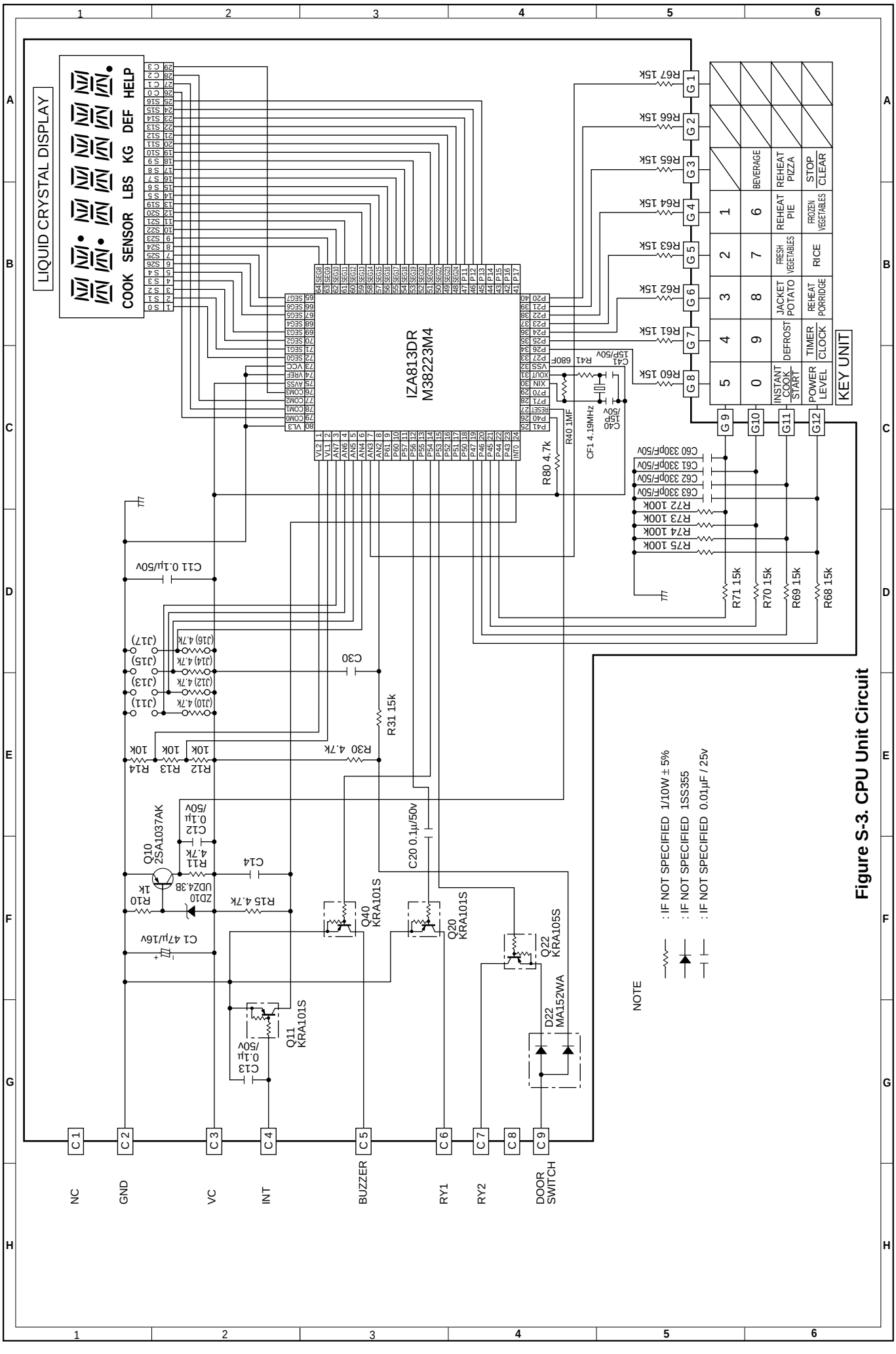


Figure S-3. CPU Unit Circuit

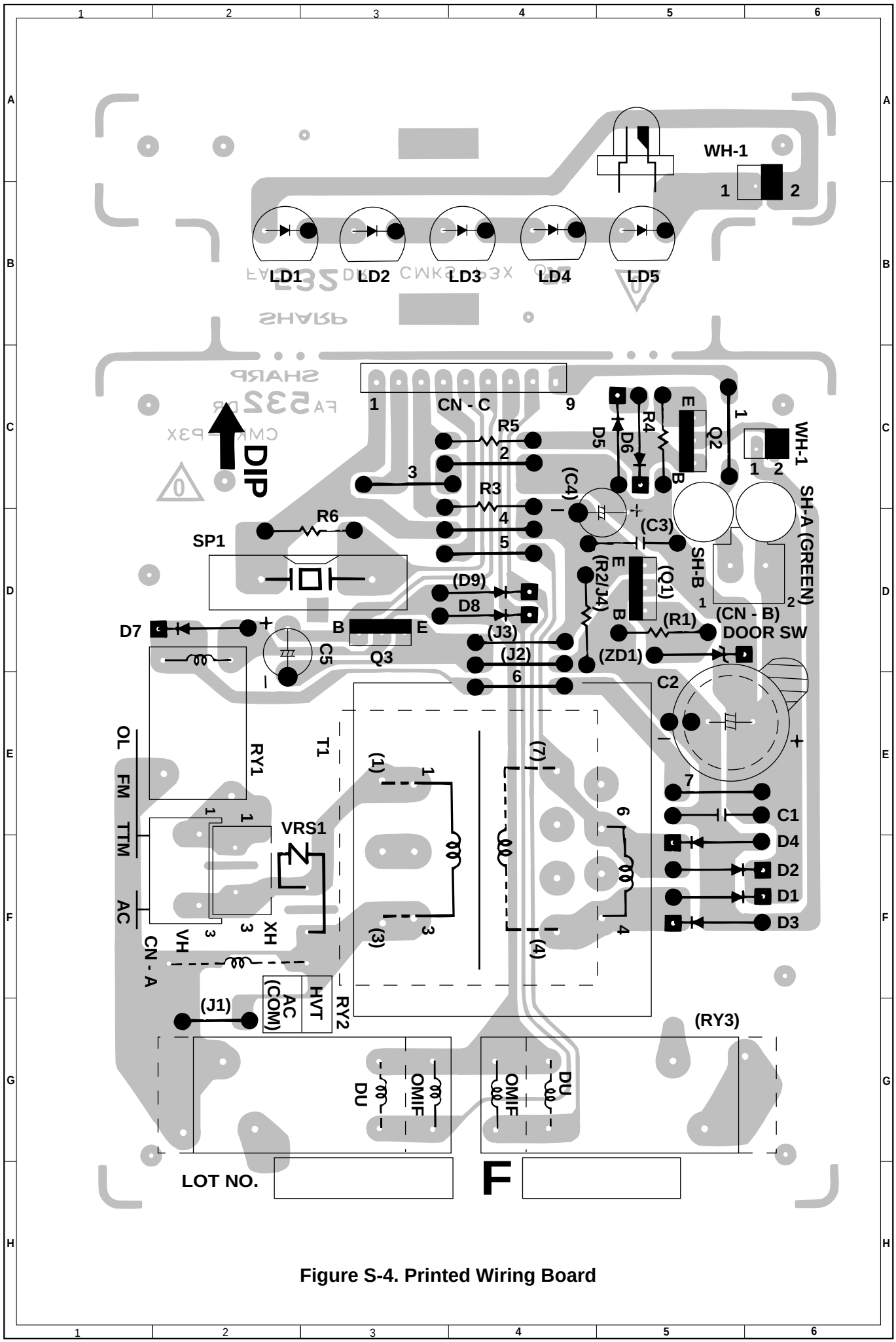


Figure S-4. Printed Wiring Board

PARTS LIST

Note: The parts marked "Δ" may cause undue microwave exposure.
The parts marked "*" are used in voltage more than 250V.

	REF. NO.	PART NO.	DESCRIPTION	Q'TY	CODE
			ELECTRIC PARTS		
	1- 1	QSW-MA110WRE0	1st. latch switch, 2nd. interlock relay control switch	2	AK
	1- 2	QSW-MA111WRE0	Monitor switch	1	AK
	1- 3	FPWBFA310WRK0	Noise filter	1	AT
	1- 4	RTHM-A078WRE0	Thermal cut-out 125˚C.	1	AL
	1- 5	QACC-A067WRE0	Power supply cord	1	AT
*	1- 6	FH-DZA075WRK0	High voltage rectifier assembly	1	AR
*	1- 7	RC-QZA215WRE0	High voltage capacitor	1	AY
*	1- 7	RC-QZA182WRE0	High voltage capacitor (Interchangeable)	1	AY
Δ*	1- 8	RV-MZA197WRE0	Magnetron	1	BN
Δ*	1- 8	RV-MZA222WRE0	Magnetron (Interchangeable)	1	BN
	1- 9	RMOTEA340WRE0	Fan motor	1	AX
	1-10	QSOCLA022WRE0	Oven lamp socket	1	AG
	1-11	RLMPTA069WRE0	Oven lamp	1	AK
	1-12	RMOTDA169WRE0	Turntable motor	1	AW
	1-13	RTHM-A079WRE0	Thermal cut-out 95 deg.	1	AL
*	1-14	RTRN-A530WRE0	Power transformer	1	BR
	1-15	QFS-CQ001YBE0	Fuse M10A	1	AE
	1-16	RR-WZA022WRE0	Monitor resistor 0.8Ω 20w	1	AK
	1-17	QFS-IA002WRE0	High voltage fuse 0.75 A	1	AQ
			CABINET PARTS		
	2- 1	GCABUA608WRP0	Outer case cabnet	1	BB
	2- 2	GDAI-A261WRW0	Bottom plate left	1	AP
	2- 3	GDAI-A286WRW0	Bottom plate right	1	AN
	2- 4	GLEGPA019WRE0	Foot	2	AD
	2- 5	GLEGPA067WRF0	Foot	1	AE
			CONTROL PANEL PARTS		
	3- 1	CPWBFA725WRK0	Power unit	1	BC
	3- 1A	QCNCMA394DRE0	2-pin connector(CN-A)	1	AD
	3- 1B	QCNCMA275DRE0	2-pin connector(CN-B)	1	AB
	3- 1C	QCNCMA422DRE0	9-pin connector(CN-C)	1	AF
	3- 1D	FW-VZA196DRE0	Lead wire harness (WH-1)	1	AD
	3- 1E	LHLD-A171WRF0	LED holder	1	AE
	C1	RC-KZA087DRE0	Capacitor 0.1µF 50V	1	AB
	C2	VCEAB31EW108M	Capacitor 1000µF 25V	1	AE
	C5	VCEAB31VW106M	Capacitor 10µF 35V	1	AA
	D1-4	VHD11ES1///-1	Diode (11ES1)	4	AB
	D5-8	VHD1SS270A/-1	Diode (1SS270ATA)	4	AA
	LD1-5	VHPSLZ381A9-3	Light emitting diode	5	AC
	Q2	VS2SA933S//-3	Transistor (2SA933)	1	AB
	Q3	VSKRC243M//-3	Transistor (KRC243M)	1	AB
	R3	VRD-B12HF751J	Resistor 750 ohm 1/2W	1	AA
	R4	VRD-B12EF270J	Resistor 27 ohm 1/4W	1	AA
	R5	VRD-B12EF472J	Resistor 4.7k ohm 1/4W	1	AA
	R6	VRD-B12EF332J	Resistor 3.3k ohm 1/4W	1	AA
	Jumper 6	VRD-B12EF151J	Resistor 150 ohm 1/4W	1	AA
	RY1	RRLY-A021DRE0	Relay (OJSH112LM-UL)	1	AH
	RY2	RRLY-A094DRE0	Relay (OMIF-S-112LM)	1	AN
	SP1	RALM-A014DRE0	Buzzer (PKM22EPT-THAI)	1	AG
	T1	RTRNPA108DRE0	Transformer	1	AR
	VRS1	RH-VZA032DRE0	Varistor (10G471K)	1	AE
	3- 2	DPWBFB693WRK0	CPU unit	1	BE
	3- 3	FPNLCB309WRK0	Control panel frame with key unit	1	BE
	3- 3-1	FUNTKA819WRE0	Key unit	1	BA
	3- 4	PSHEPA588WRE0	LED sheet	1	AE
	3- 5	JBTN-B069WRF0	Open button	1	AF
	3- 6	MSPRCA050WRE0	Open button spring	1	AB
	3- 7	XEPSD30P08XS0	Screw ; 3mm x 8mm	4	AA
			OVEN PARTS		
	4- 1	LANGQA456WRP0	Noise filter angle	1	AG
	4- 2	PCUSGA312WRP0	Cushion	1	AB
Δ	4- 3	PHOK-A095WRF0	Latch hook	1	AN
	4- 4	LBNDKA099WRW0	Capacitor holder	1	AD
	4- 5	NFANJA029WRE0	Fan blade	1	AL
	4- 6	PDUC-A652WRP0	Fan duct	1	AU
Δ	4- 7	FOVN-A375WRT0	Oven cavity	1	BH
	4- 8	LANGFA175WRP0	Chassis support	1	AX

Note: The parts marked "Δ" may cause undue microwave exposure.
The parts marked "*" are used in voltage more than 250V.

REF. NO.	PART NO.	DESCRIPTION	Q'TY	CODE
4- 9	LANGQA452WRP0	Partition angle	1	AK
4-10	LANGQA454WRP0	MG thermo angle	1	AH
4-11	MLEVPA194WRF0	Switch lever	1	AG
4-12	NCPL-A045WRF0	Coupling	1	AH
4-13	PPACGA084WRF0	TTM packing	1	AF
4-14	PCOVPA275WRE0	Waveguide cover	1	AR
4-15	PCUSGA339WRP0	Cushion	2	AG
4-16	PCUSUA212WRP0	Cushion	1	AB
4-17	PCUSUA235WRP0	Cushion	1	AF
4-18	PCUSUA376WRP0	Cushion	1	AG
4-19	LSTPPA162WRF0	Door stopper	1	AE

DOOR PARTS

Δ	5	CDORFA773WRK0	Door assembly	1	BL
Δ	5- 1	FDORFA303WRT0	Door panel	1	BA
	5- 2	PSHEPA382WRE0	Sealer film	1	AH
	5- 3	GWAKPA505WRR0	Door frame	1	AY
	5- 4	HPNL-A673WRR0	Door screen	1	AT
Δ	5- 5	GCOVHA370WRF0	Choke cover	1	AM
	5- 6	LSTPPA139WRF0	Latch head	1	AF
	5- 7	MSPRTA084WRE0	Latch spring	1	AB
	5- 8	XCPSD40P08000	Screw : 4mm x 8mm	1	AA
	5- 9	XCPSD40P08WN2	Screw : 4mm x 8mm	1	AC

MISCELLANEOUS

6- 1	FROLPA079WRK0	Turntable support	1	AQ
6- 2	NTNT-A084WRE0	Turntable tray	1	AR
6- 3	FW-VZB602WRE0	Main wire harness	1	AV
6- 4	PZET-A012WRE0	Terminal insulator	1	AB
6- 5	FW-VZB045WRE0	Switch harness	1	AG
6- 6	LHLDWA011WRE0	Purse lock M	1	AB
6- 7	TCAUHA214WRR0	Caution label	1	AC
6- 8	TINSEA712WRR0	Instruction book	1	AK
6- 9	TSPCNC489WRR0	Rating label	1	AD
6-10	TCADCA640WRR0	Cook book for microwave cooking	1	AN
6-11	TCADCA641WRR0	Cook book in Russian	1	AX

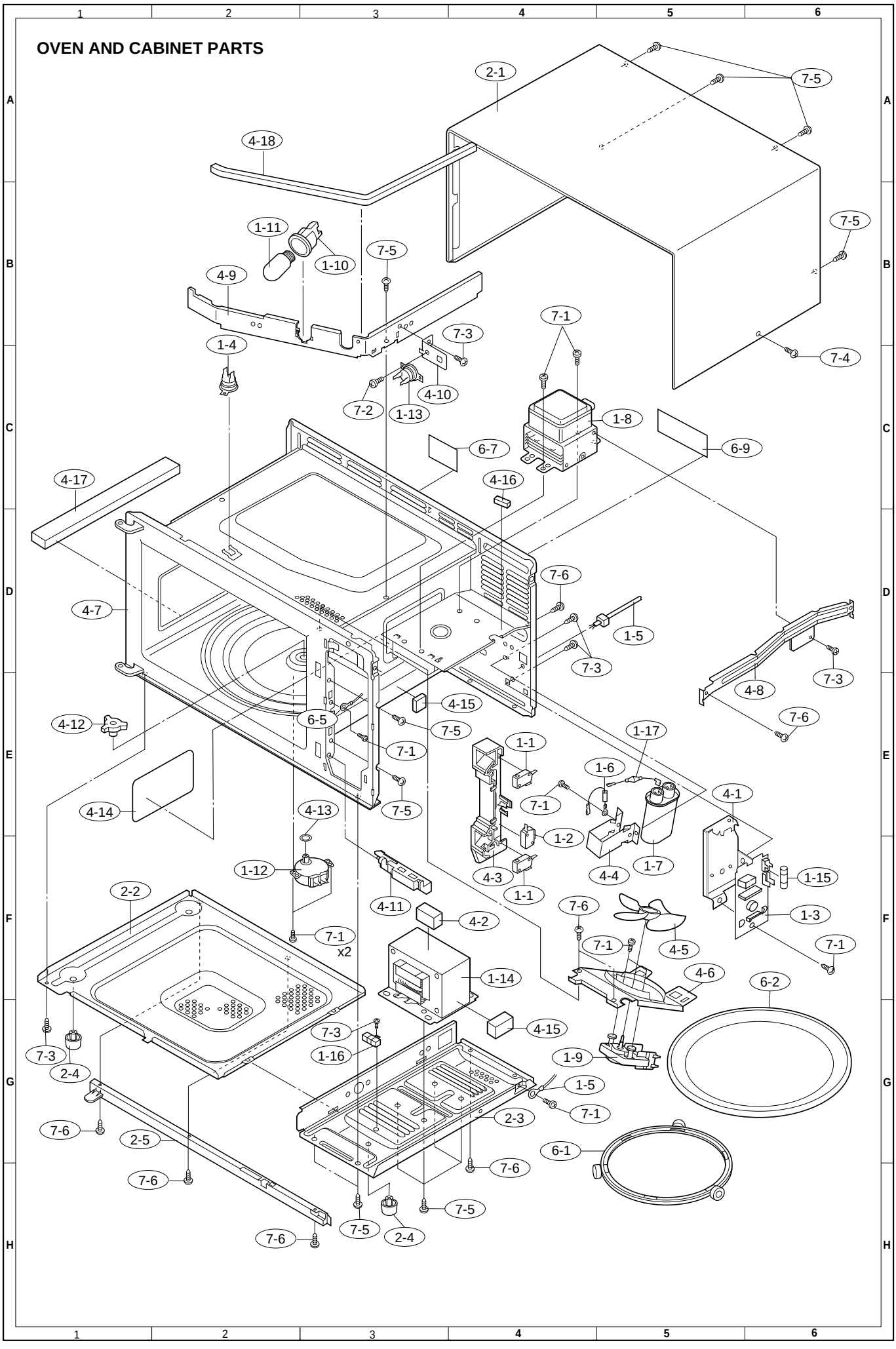
SCREWS,NUTS AND WASHERS

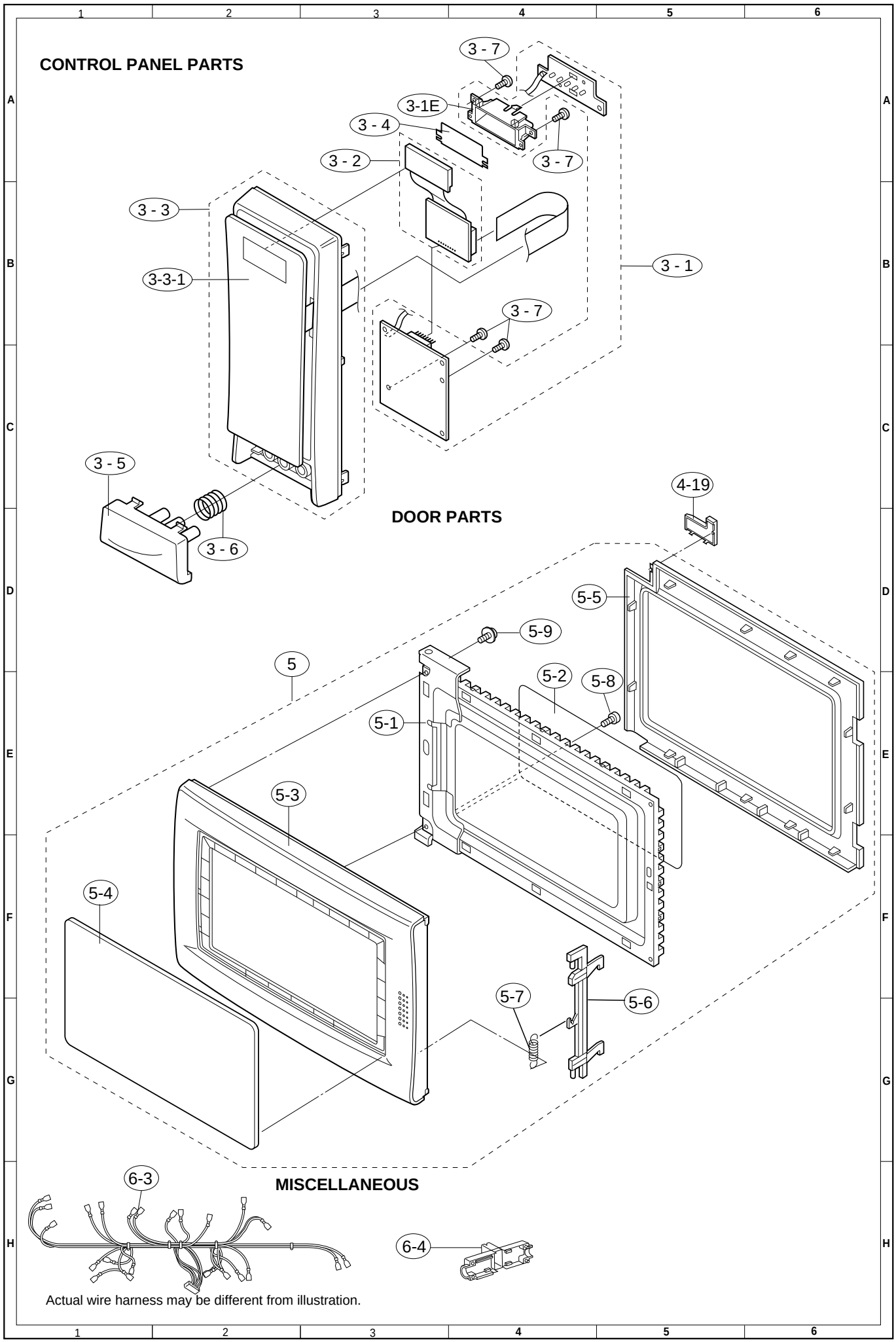
7- 1	XFPSD40P08K00	Screw : 4mm x 8mm	10	AA
7- 2	XFPSD30P06000	Screw : 3mm x 6mm	1	AA
7- 3	XHTSD40P08RV0	Screw : 4mm x 8mm	6	AA
7- 4	XOTSE40P08000	Screw : 4mm x 8mm	1	AA
7- 5	XOTSD40P12RV0	Screw : 4mm x 12mm	13	AA
7- 6	XOTSD40P12000	Screw : 4mm x 12mm	8	AA

HOW TO ORDER REPLACEMENT PARTS

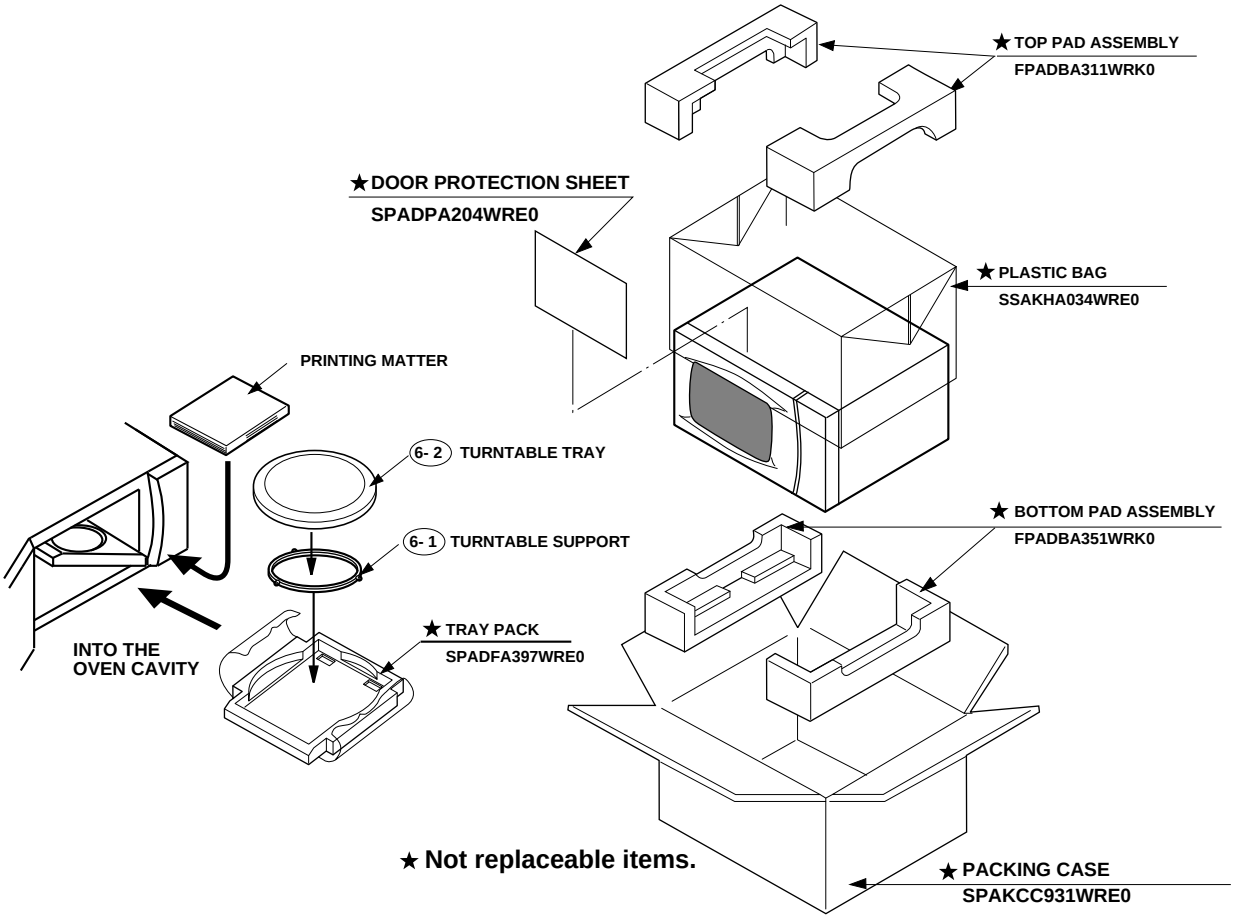
To have your order filled prompty and correctly, please furnish the following information.

1. MODEL NUMBER
2. REF. NO.
3. PART NO.
4. DESCRIPTION


OVEN AND CABINET PARTS
2-1
7-5
4-18
1-11
1-10
7-5
7-5
4-9
7-1
1-4
7-3
7-4
4-10
7-2
1-13
1-8
6-7
6-9
4-17
4-16
7-6
4-7
1-5
7-3
4-8
7-3
4-15
4-12
6-5
7-5
7-6
1-1
1-17
7-1
1-6
4-14
7-5
7-1
4-13
4-1
1-2
1-12
4-3
4-4
1-7
1-15
1-1
4-11
2-2
4-2
7-6
1-3
7-1
x2
7-1
4-5
1-14
4-6
6-2
7-3
4-15
1-16
1-9
7-3
2-4
1-5
7-1
2-3
7-6
2-5
6-1
7-6
7-5
7-5
7-6
2-4


CONTROL PANEL PARTS
3 - 7
3-1E
3 - 4
3 - 2
3 - 7
3 - 3
3-3-1
3 - 1
3 - 7
3 - 5
3 - 6
DOOR PARTS
4-19
5-5
5-9
5
5-2
5-8
5-1
5-3
5-4
5-7
5-6
MISCELLANEOUS
6-3
6-4
Actual wire harness may be different from illustration.

PACKING AND ACCESSORIES



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